FEB/FY06

FORT EUSTIS
Virginia

Army Defense Environmental Restoration Program Installation Action Plan

Final 17 April 2006

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Statement of Purpose

The purpose of the Installation Action Plan (IAP) is to outline the total multi-year Cleanup Program for an installation. The plan identifies environmental cleanup requirements at each site or area of concern, and proposes a comprehensive, installation-wide approach, with associated costs and schedules, to conduct investigations and necessary remedial actions (RAs).

In an effort to coordinate planning information between the restoration manager, US Army Environmental Center (USAEC), Fort Eustis, the Installation Management Agency (IMA), the executing agencies, and the regulatory agencies, an IAP was completed. The IAP is used to track requirements, schedules and tentative budgets for all Army installation cleanup programs.

All site-specific funding and schedule information has been prepared according to projected overall Army funding levels and is, therefore, subject to change.

The following agencies contributed to the formulation and completion of this IAP during a planning workshop held on 8 February 2006:

Company/Installation/Branch

Engineering and Environment, Inc. (EEI) for USAEC

Fort Eustis Directorate of Public Works (DPW) – Environmental Division

Fort Eustis Staff Judge Advocate

IMA - North Environmental Regional Office (NERO)

Malcolm Pirnie

USAEC

US Army Corps of Engineers, Baltimore District (CENAB)

US Environmental Protection Agency (USEPA), Region III

Virginia Department of Environmental Quality (VDEQ)

Acronyms

AAFES	Army, Air Force Exchange Service
AEDB-R	Army Environmental Data Base-Restoration
AR	Administrative Record
AST	Aboveground Storage Tank
ATSDR	Agency for Toxic Substances and Disease Registry
BNA	Base-neutral and Acid Extractable Compounds
BTEX	Benzene, Toluene, Ethylbenzene and Xylene
CAP	Corrective Action Plan
CENAB	US Army Corps of Engineers, Baltimore District
CENAO	US Army Corps of Engineers, Norfolk District
CERCLA	Comprehensive Environmental Response Compensation and Liability Act (1980)
CMI(C)	Corrective Measures Implementation (Construction)
CMI(O)	Corrective Measures Implementation (Operation)
CMS	Corrective Measures Study
CRP	Community Relations Plan
CS	Confirmation Study
CTT	Closed, Transferring and Transferred
DD	Decision Document
DDT	Dichlorodiphenyltrichloroethene
DERP	Defense Environmental Restoration Program
DES	Design
DOL	Directorate of Logistics
DMM	Discarded Military Munitions
DoD	Department of Defense
DPT	Direct Push Technologies
DPW	Directorate of Public Works
FFA	Federal Facility Agreement
FS	Feasibility Study
FTEUST	Fort Eustis (as designated in AEDB-R)
FY	Fiscal Year
HMA	Helicopter Maintenance Area
HRR	Historical Records Review
IAP	Installation Action Plan
IMA	Installation Management Agency
IMP(C)	Implementation (Construction)
IMP(O)	Implementation (Operation)
INV	Investigation
IR	Information Repository
IRA	Interim Remedial Action
IRP	Installation Restoration Program
ISC	Initial Site Characterization
K	$1,000
LNAPL	Light Non-Aqueous Phase Liquid
LTM	Long Term Management
LVE	Liquid Vapor Extraction

Acronyms

MC	Munitions Constituents
MCL	Maximum Contaminant Level
MMRP	Military Munitions Response Program
NERO	Northeast Environmental Regional Office
NFA	No Further Action
NOAA	National Oceanic and Atmospheric Administration
NPL	National Priorities List
PA	Preliminary Assessment
PAO	Public Affairs Office
PAS	Preliminary Assessment Screening
PCB	Polychlorinated biphenyl
PCE	Tetrachloroethylene
PHEA	Public Health and Environmental Assessment
POL	Petroleum, Oil & Lubricants
PP	Proposed Plan
RA	Remedial Action
RA(C)	Remedial Action (Construction)
RA(O)	Remedial Action (Operation)
RAB	Restoration Advisory Board
RAC	Risk Assessment Code
RC	Response Complete
RCRA	Resource Conservation and Recovery Act
RD	Remedial Design
REM	Removal
RFA	RCRA Facility Assessment
RFI	RCRA Facility Investigation
RI	Remedial Investigation
RIP	Remedy in Place
ROD	Record of Decision
RRSE	Relative Risk Site Evaluation
SCR	Site Characterization Report
SI	Site Inspection
SVE	Soil Vapor Extraction
SVOC	Semi-Volatile Organic Compounds
TAL	Target Analyte List
TAPP	Technical Assistance for Public Participation
TCL	Target Compound List
TFH-H	Total Fuel Hydrocarbons – Heavy Fraction
TPH	Total Petroleum Hydrocarbons
TRC	Technical Review Committee
ug/l	microgram per liter
USACE	United States Army Corps of Engineers
USACHPPM	United States Army Center for Health Promotion and Preventive Medicine (formerly USAEHA)
USAEC	United States Army Environmental Center
USAEHA	United States Army Environmental Hygiene Agency (now USACHPPM)

Acronyms

USATHAMA United States Army Toxic and Hazardous Material Agency (now USAEC)
USEPA United States Environmental Protection Agency
UST Underground Storage Tank
UXO Unexploded Ordnance
VDEQ Virginia Department Environmental Quality
VOC Volatile Organic Compounds

Installation Information

Installation Locale: Fort Eustis is located in southeastern Virginia, within the City of Newport News, Virginia. Fort Eustis is a peninsula formed by the Warwick River and the James River. The installation exceeds 8,200 acres in area and approximately 15,000 military personnel and civilians work, live, or train at Fort Eustis.

Installation Mission: Fort Eustis is the home of the US Army Transportation Corps, US Army Transportation Center, Army Transportation School, Non-Commissioned Officers Academy, Army Aviation Logistics School, 8th Transportation Brigade and 7th Transportation Group (Composite). Other significant tenants include the Military Surface Deployment and Distribution Command – Operations Center, Army Training Support Center and the Army Aviation Applied Technology Directorate. At Fort Eustis, officers and enlisted soldiers receive education and on-the-job training in all modes of transportation, aviation maintenance, logistics and deployment doctrine and research.

Lead Organization: IMA-NERO, Fort Monroe, VA

Lead Executing Agencies:
Investigation/Long-term Management (LTM)/Design Phase Executing Agency: CENAB and US Army Corps of Engineers, Norfolk District (CENAO)
RA Phase Executing Agency: CENAO and Army Contracting Agency – Northern Region Contracting Center (NRCC) and Directorate of Contracting (DOC) at Fort Eustis.
Interim Remedial Action (IRA) Phase Executing Agency: CENAB
Underground Storage Tank (UST) Investigations/Actions: Army Contracting Center - NRCC and DOC at Fort Eustis.

Regulatory Participation
Federal: USEPA Region III, Federal Facilities Section.
- US Fish and Wildlife Service
- National Oceanic and Atmospheric Administration (NOAA)

State: VDEQ, Federal Facilities Program and Restoration Section (USTs).

National Priorities List (NPL) Status: Proposed on 18 January 1994, Final Listing on 16 December 1994

Projected Dates for Construction Completion: 2008

Projected Date for NPL Removal: 2014

Installation Restoration Advisory Board (RAB)/Technical Review Committee (TRC)/Technical Assistance for Public Participation (TAPP) Status: The TRC was established in April 1995. In October 2000, Fort Eustis conducted the first off-post evening TRC meeting open to the public at a local library. Since Oct 2000, semi-annual TRC meetings have been held. Advertisements for the TRC meeting are placed in three local newspapers and the on-post newspaper to get community interest.

Fort Eustis solicited community interest in formation of RAB in February 1997 and March 1999. No significant interest was noted. In December 1999, community interviews were conducted as part of updating Fort Eustis' Community Relations Plan (CRP). An USEPA representative participated in the interview process and noted from the responses during the interviews that sufficient community interest to form a RAB does not exist. Fort Eustis is currently updating the CRP. The updated CRP will make recommendations and outline how Fort Eustis will inform the community of the cleanup process being conducted on post. In 2004 Fort Eustis solicited interest in a RAB. Once again, no significant interest was noted.

Installation Program Summaries

IRP

Primary Contaminants of Concern: Polychlorinated Biphenyl (PCB), Petroleum/Oil/Lubricants (POL), Metals, Volatile Organic Compounds (VOCs)
Affected Media of Concern: Surface Water, Groundwater, Soil, Sediment
Estimated Date for Remedy in Place (RIP)/Response Complete (RC): 2010/2014
Funding to Date (up to FY05): $49,122,000
Current Year Funding (FY06): $1,378,100
Cost-to-Complete (FY07+): $5,361,000

MMRP

Primary Contaminants of Concern: Munitions constituents (MC)
Affected Media of Concern: Soil
Estimated Date for RC: 2017
Funding to Date (up to FY05): $251,345
Current Year Funding (FY06): $0
Cost-to-Complete (FY07+): $44,405,000

Installation Historic Activity

Fort Eustis is an active installation that is not scheduled for base closure. The Installation was originally established during World War I as a replacement-training center for Coast Artillery Corps units and a balloonist school. After being established as a permanent military installation in 1923, Fort Eustis was deactivated in 1931. Following deactivation, Fort Eustis was used as a federal correction camp, a Works Progress Administration facility, and a Nation Youth Administration facility. During the late 1930s and early 1940s, the Mulberry Island portion (i.e., southern half of the Installation) of Fort Eustis was used as a bombing range for Langley Air Force Base. Fort Eustis was brought back into military service for World War II and was used by the Coast Artillery for anti-aircraft training and as a prisoner-of-war camp. In 1946, Fort Eustis became the transportation-training center for the US Army.

A TRC was established in April 1995. Members of the committee include Fort Eustis, USEPA, VDEQ, US Fish and Wildlife, NOAA, Virginia Institute of Marine Science, City of Newport News Emergency Services, City of Newport News Wetlands Board, Virginia Department of Emergency Services, Virginia Department of Health, Virginia Marine Resource Commission and several local community members. Meetings were held quarterly throughout 1995. However, the meetings are now being conducted semi-annually with a written status/newsletter sent to each member between the meetings. After soliciting interest in the formation of RAB in February 1997, four additional members were added to the TRC. Again in March 1999, Fort Eustis solicited interest in the formation of the RAB. However, there was not enough interest to form a RAB. In December 1999, community interviews supported Fort Eustis' decision in not forming a RAB. The October 2000 TRC meeting was conducted in the evening at an off-post location and it was open to the public. In 2004 Fort Eustis solicited interest in a RAB. Once again, no significant interest was noted. TRC meetings have been held semi-annually since October 2000**.**

IRP

Prior Year Progress: Fort Eustis initiated a Vegetative Management Program at Landfill 15. Native vegetation was planted which lowers maintenance costs and provides food and habitat for many species. Yearly maintenance of the cap (i.e. mowing, over seeding, erosion control, etc.) will continue throughout the life of the closed landfill. Long-term semi-annual groundwater monitoring will continue through 2006, at which time Fort Eustis will petition VDEQ to terminate groundwater monitoring. The methane gas-venting trench will passively vent throughout the life of the closed landfill. Monthly monitoring of the methane gas will continue.

Continue to operate passive soil vapor extraction (SVE) system at Landfill 7. Yearly maintenance of the cap (i.e. mowing, seeding, erosion control, etc.) will continue throughout the life of the closed landfill.

Cleanup Program Summary

A groundwater and soil study was completed at the Firefighting Training Area to delineate groundwater contamination and data was used to determine the placement of new monitoring wells to be used during the Treatability Study. A feasibility study (FS) will be completed to select the most appropriate technology for groundwater cleanup.

A FS and a Proposed Plan (PP) were completed for the Brown's Lake Site. A draft Record of Decision (ROD) was submitted for regulatory review in July 2005. The Draft ROD presents the selected remedial alternative, which includes a removal action in the upper drainage ditch of the site, installation of some type of sediment control device, land use controls, and monitoring. LTM will be conducted for ten years. LTM will consist of annual surface water, sediment and fish samples taken every third year as proposed by the FS.

A FS is currently underway for both Bailey Creek and Eustis Lake sites. There are ongoing discussions with Fort Eustis, USAEC, and regulators regarding PCB Congener analysis. Regulators have requested additional sampling be conducted at Bailey Creek and the data be used to prepare a revise risk assessment. It is anticipated that land use controls, such as no fishing, will remain in affect. Ten years of LTM will be conducted before site closure is petitioned.

The Draft Remedial Investigation (RI) for the Felker Airfield Tank Farm recommends a FS be conducted. It is expected that the FS will recommend groundwater monitoring be conducted annually for five years as part of a monitored natural attenuation program. At the end of the five years, Fort Eustis will likely petition USEPA and VDEQ for no further action (NFA) and site closure.

LTM will continue at the Landfill 7, Landfill 15, Oil Sludge Holding Pond, DOL Storage Yard, Helicopter Maintenance Area, and AAFES Service Station sites.

It is anticipated that the installation will request NFA from the USEPA and VDEQ for the Milstead Island Creek and Third Port UST sites.

Future Plan of Action: The installation plans to complete the remedial design (RD) and RA and award the LTM contract at Brown's Lake. Award a remedial design for the Fire Training Area. Initiate LTM at the Felker Airfield Tank Farm site. LTM will continue at the Landfill 7, Landfill 15, Oil Sludge Holding Pond, DOL Storage Yard, Helicopter Maintenance Area, and AAFES Service Station sites.

MMRP

Prior Year Progress: The Preliminary Assessment (PA) is completed at all sites. A Site Inspection (SI) contract was awarded in FY05.

Future Plan of Action: The installation plans to complete the SI by FY07 and execute follow on phases/actions as required in the individual site cleanup strategies.

FORT EUSTIS

Installation Restoration Program

IRP Summary

Total Army Environmental Database – Restoration (AEDB-R) IRP Sites/AEDB-R Sites with RC: 27/14

Different Site Types:

1 Fire/Crash Training Area
4 Surface Disposal Areas
3 Landfills
2 Surface Impoundment/Lagoons
1 Aboveground Storage Tank (AST)
1 Waste Treatment Plant
1 Unexploded Munitions/Ordnance
3 Contaminated Sediments
1 Incinerator
2 Storage Areas
1 Spill Site Area
6 USTs
1 Other

Most Widespread Contaminants of Concern: PCB, POL, Metals, VOCs

Media of Concern: Surface Water, Groundwater, Soil, Sediment

Completed Removal (REM)/IRA/RA:

- IRA at FTEUST-29; capping of lake bottom (FY98-99)
- IRA at FTEUST-30; removal of contaminated soil (FY99)
- RA at FTEUST-34; removal of contaminated soil (FY03)
- RA at FTEUST-19; removal of contaminated soil (FY04)

Total IRP Funding

Prior Years (up to FY05): $49,122,000
Current Year Funding (FY06): .....$ 1,378,100
Future Requirements (FY07+): ...$ 5,361,000
Total: $55,861,100

Duration of IRP

Year of IRP Inception: 1977 (Landfill Study)
Year of IRP RIP/RC: 2010/2014
Year of IRP Completion including LTM: 2024

IRP Contamination Assessment Overview

Contamination assessments at Fort Eustis started in 1977 when the US Army Environmental Hygiene Agency (USAEHA) conducted a landfill study to evaluate the impact to surrounding areas from two Fort Eustis landfills. The USAEHA study investigated Inactive Landfill #15 (FTEUST-02) and Area 3300 Landfill #7 (FTEUST-04) to determine whether landfill leachate was adversely affecting aquatic systems in the low-lying water bodies bordering the landfills. The results of the USAEHA study at Inactive Landfill #15 and Area 3300 Landfill #7 concluded that the two landfills had caused degradation to groundwater.

An Installation Assessment report for Fort Eustis was completed in March 1982 and an Update to the Installation Assessment was completed in March 1988. The purpose of the Installation Assessment was to identify areas where toxic and hazardous materials may have been used, and where the potential for off-post migration may exist. The studies addressed 21 sites including the sewage treatment plant, various landfills, holding ponds, dredge spoils areas, and a fire training area. Based on the information collected for the Installation Assessment, it was concluded that there is a potential for contaminant migration via surface streams and through the upper water table to the James River.

Between 1983 and 1988, USAEHA, CENAO, and Sirrine Environmental Consultants, Inc conducted a series of landfill studies. They evaluated the impact of three Fort Eustis landfills (FTEUST-01, FTEUST-02, and FTEUST-04) on groundwater and nearby receiving waters. In 1990, James M. Montgomery, Consulting Engineers (JMM) completed a FS to evaluate remedial alternatives to effectively close FTEUST-02 (Inactive Landfill #15) and FTEUST-04 (Area 3300 Landfill #7). From 1990 to 1995, JMM collected groundwater samples from monitoring wells at FTEUST-01 (Officers Club Landfill 1) to monitor for potential contaminant migration to groundwater. Groundwater and methane monitoring will continue at Landfill 15 through FY06. The SVE system, installed in 1998, continues to operate at Landfill 7. In addition, five buildings adjacent to the landfill are monitored for methane gas.

In January 1990, JMM initiated a RI/Public Health and Environmental Assessment (PHEA) for four sites located at Fort Eustis. The following sites were evaluated: Fire Training Area (FTEUST-06), Milstead Island Creek (FTEUST-27), Brown's Lake (FTEUST-29) and Bailey Creek (FTEUST-30). This evaluation involved several phases of activity, such as collecting additional environmental data to characterize site conditions, determining the nature and extent of contamination at the site, and assessing the baseline human health and environmental risks posed by constituents detected in site media. In order to complete the RI/PHEA report, additional field data was collected in May 1993 and June 1994. As part of the 1994 work, an Environmental Risk Assessment was conducted to address the potential for chemicals associated with the sites reaching adjacent streams, wetlands, or marine environments and whether the presence of these chemicals pose a significant risks to fresh water, marine, wetland and terrestrial biota. A Five-Site Draft RI report, which included these four sites and the Oil/Sludge Holding Pond (FTEUST-19) was distributed to the USEPA and VDEQ in January 1995. Their comments were addressed and a Final RI report was distributed in February 1997. In October 1998, a meeting was

held with the USEPA and VDEQ to address the outstanding comments on the Final RI report. In December 1998, USEPA sent Fort Eustis a letter outlining their concerns.

They recommended a FS be conducted at all of the sites with additional sampling at some of them to fill in the data gaps. FSs were awarded in 1998 for Brown's Lake, 2000 for Bailey Creek, 2000 for the Fire Training Area and 2000 for the Oil/Sludge Holding Pond. In 2001, the FS was awarded for Milstead Island Creek.

At the Fort Eustis Helicopter Maintenance Area (FTEUST-26), a Contamination Investigation was initiated by JMM in October 1990 to address a subsurface release of Jet Propellant 4 (JP-4) jet fuel to soil and groundwater. A scope of work was designed to meet VDEQ's regulatory requirements for leaking USTs, which included the preparation of an Initial Abatement Report and Site Characterization Report. The Site Characterization Report is equivalent to a RI/FS. The reports recommended NFA with long-term monitoring. VDEQ reviewed the documents and has requested a Corrective Action Plan (CAP). The plan recommended recovering only the fuel with no treatment of the groundwater. A free product recovery system was installed in December 1995 and was subsequently shut down in 1998. In December 1999, a meeting was held with VDEQ to discuss the possibility of sampling and closing some of the monitoring wells at this site. VDEQ recommended ten wells be sampled and the results evaluated to determine if some of the wells could be closed. In June 2000, fourteen wells were sampled and Fort Eustis recommended closing thirteen of them. VDEQ concurred with this recommendation and in 2001 these wells were closed. Monitoring events in 2002 showed an increase in the occurrence of free product in several wells. After consultation with VDEQ, Fort Eustis began conducting Liquid Vapor Extraction (LVE) events in January 2003. In the 2003 Annual Free Product Recovery Report, Fort Eustis recommended sampling 16 wells to determine if any were eligible for closure. The wells were sampled and results were discussed with VDEQ. A letter was sent to VDEQ in February 2004 recommending the closure of 12 wells and the VDEQ concurred. The 12 wells were abandoned in place in November 2004. Ten remaining wells are currently monitored at the site.

In 1989, JMM initiated a PA/SI study for 10 sites at Fort Eustis and it was completed in January 1992. The following sites were evaluated: Site 5-Goose Island Dredge Spoil Area (FTEUST-11), Site 12-Mulberry Island Dredge Spoil (FTEUST-12), Site 13-Mulberry Island Dredge Spoil (FTEUST-13), Site 14-Mulberry Island Dredge Spoil (FTEUST-14), Oil/Sludge Holding Pond (FTEUST-19), Central Heat Plant Building 801 (FTEUST-21), Waste Oil Storage Tank (FTEUST-28), Past Pesticide Storage Area (FTEUST-31) and two off-post NIKE facilities. The PA/SI activities at Fort Eustis were designed to confirm the presence or absence of significant contamination in site soils, sediments, groundwater, and surface waters, to qualitatively assess the potential for contaminant migration into the surrounding wetland areas, and to define future investigations or other actions required. The following recommendations were made: FTEUST-11, 13, and 14, NFA; FTEUST-28 and 31, further confirmatory investigation (PA/SI Phase II); FTEUST-19 and 21, RI/FS recommended. The Oil/Sludge Holding Pond (FTEUST-19) was further evaluated as part of Five Site RI as previously mentioned. The PA/SI Phase II for FTEUST-28 and 31 was

conducted and a final report issued in January 1996. The report recommended NFA for both sites.

In order to support Army Regulation 200-1 requirements for new construction projects, JMM conducted a Preliminary Assessment Screening (PAS) for one site at Fort Eustis: the Felker Airfield Tank Farm (FTEUST-32). The PAS was completed in October 1992, which identified soil and groundwater contamination from petroleum. An IRA was initiated in January 1993 at the site and was completed in March 1994. Approximately 3,800 cubic yard of contaminated soil was removed and treated. The fueling system and associated piping was also removed and replaced to meet current regulatory requirements. A Site Characterization Report meeting the Virginia UST regulations was prepared and sent to VDEQ, Storage Tank Section 1995. The report recommended NFA at the site and VDEQ approved the recommendation. In May 1996, the Remediation Section of VDEQ recommended further investigation because of the metals detected. In September 2000, USEPA and VDEQ expressed further concerns and recommended additional sampling. In FY00, a RI/FS was awarded to address USEPA and VDEQ comments. Additional sampling was conducted in October 2002, and results were incorporated into the RI. The Draft RI, recommending and FS due to elevated risk to both human and ecological receptors, was submitted for regulatory review in February 2004.

The RI fieldwork at the DOL Storage Yard Building 1607 (FTEUST-34) was conducted in October 1995. Pesticides/herbicides and transformers were stored at the site. A sampling event conducted in November 1993 detected pesticides and PCBs at levels of concern. A RI summary report was prepared and sent to USEPA and VDEQ for review. The report recommended additional soil, sediment and groundwater samples were taken. The field effort for this additional sampling was conducted in September and October 1996. A draft report was submitted to the USEPA and VDEQ in May 1997. Based on the Draft RI for the DOL Storage Yard, an IRA was conducted. In July 1997, the storage yard was capped with asphalt. This action eliminated the human exposure to the surface soils and prevented further migration of soil off-site by surface run-off. In June 1999, USEPA submitted comments to the draft report. In July 2001, the Final RI was completed. The FS was awarded in FY98 to include the development of the PP and ROD. It was complete in August 2001. The ROD was signed in September 2001. The selected remedy will be excavation of contaminated areas and off-site disposal at appropriate facilities. The RA was initiated in December 2002. 5,200 tons of contaminated soils were removed from the site. Restoration was completed in July 2003. The site is currently secured with fencing and signs. LTM will be conducted through FY08.

During an UST closure event in July 1992 at the AAFES Service Station, a used oil tank was removed from the rear of the service building and unidentified petroleum contamination was observed in the subsurface sediments. It was determined that the contamination was not related to the removed oil tank, but may have been related to past leaks from the active six 10,000 gallon gasoline USTs. In December 1992, a Site Characterization was initiated. The characterization recommended a more detailed subsurface investigation to locate the source of the release, to delineate the contamination plumes and to determine the remediation technologies. In December 1993, an expanded

investigation report was submitted to VDEQ. Free product was detected in several wells. Additional wells were installed and a CAP was prepared and submitted to VDEQ in May 1995. VDEQ reviewed the CAP but did not approve it. They approved a six-month bailing and monitoring activity that was completed in January 1996 and the CAP Addendum was submitted in April 1996, which recommended a free product recovery system. The free product recovery system was installed and became operational in October 1996. Two additional wells were added to the system in January 1997. Monitoring events in 2002 showed an increase in the amount of free product in several wells. After consultation with VDEQ, Fort Eustis began conducting monthly LVE events in January 2003. In the 2003 Annual Free Product Recovery Report, Fort Eustis recommended shutting down the automatic recovery system as it no longer operated effectively. VDEQ agreed and the system was shut down on 21 January 2004. As of December 2005, approximately 2700 gallons of free product have been recovered.

In 1995, a new site, Eustis Lake, was identified when fish were collected and analyzed and found to have elevated levels of PCBs in their tissue. The man-made 45-acre lake was constructed in the 1950s and is located in the middle of Fort Eustis. The lake is used for recreational fishing and boating. The PCBs were detected at a level that warranted a fishing advisory. In June 1995, the post instituted a catch and release policy prohibiting human consumption of fish. A RI and FS were awarded in December 1995 and FY97, respectively. The RI field efforts started in October 1996 after USEPA and VDEQ approved the work plans. The RI was finalized in July 2003. A draft FS, recommending fishing restrictions and long-term monitoring was submitted for regulatory review in February 2003. USEPA and VDEQ recommended additional sediment and fish tissue sampling. Sampling was conducted during the spring of 2003 and 2004. The purpose of this sampling event was to collect and analyze sediment and fish tissue samples to assess any trends in the PCB data since the previous samples were collected during the RI. The data will be used to aid in the selection of potential remedial alternatives to be discussed in the FS.

The Department of Health and Human Service's Agency for Toxic Substances and Disease Registry (ATSDR) conducted their initial site visit to Fort Eustis in February 1995. ATSDR's visit is a requirement of Fort Eustis being placed on USEPA's NPL. In April 1995, ATSDR provided Fort Eustis a site summary and site ranking. ATSDR issued Fort Eustis a "C" ranking because of Bailey Creek and Eustis Lake as possible points of exposure to PCB contamination. In January 1996, they sent Fort Eustis a pre-public Public Health Assessment for review and comments. The Assessment indicated contamination of the soil, groundwater and sediment does not represent hazards to public health. The principle exposure pathway of concern is the consumption of PCB-contaminated fish from Bailey Creek and Eustis Lake. ATSDR made the following recommendations: additional sampling of fish tissue in Bailey Creek is needed; institutional controls remain or be put in place at Bailey Creek and Eustis Lake for fish consumption; and sampling of the tributaries of the Warwick River continue as planned. On 8 May 1996, ATSDR released their Public Health Assessment to the public for comments. On 19 July 1996, the final assessment was released.

A CRP was developed in 1995. The plan identifies issues of community concern and describes the community relations program that will be implemented throughout the cleanup process at Fort Eustis. Community residents, elected officials and local environmental groups were interviewed to get their concerns on restorations issues. The plan is a living document and is currently being updated. The following are some of the recommendations being proposed in the updated plan:

- Broaden and maintain mailing list of interested parties
- Publish and disseminate fact sheets three or four times a year
- Provide IRP related information on a web site
- Distribute environmental information regularly through the local print media
- Establish contacts with key community members and public officials
- Provide information to on-post residents and employees via Commander's Call/Sergeants Time and though the local post newspaper

The Fort Eustis Administrative Record (AR) and Information Repositories (IR) were established April 1996. The AR has all the guidance, correspondence and documents that were used to make a remedial decision at an IRP site. The AR is maintained at the Fort Eustis Environmental Office and three local libraries (IR). In September 1997, the paper copy of the AR was replaced with CD-ROM disks. In July 1998 and September 1999, the record was updated and new update CD-ROM disks was created. In the fall of 2000, the files were converted to a PDF file- format and put on new disks. New documents and information were also scanned and placed on the new disks. The administrative record was put on the Fort Eustis web site in 2001. However, due to Department of Army security and web access, the administrative record was removed. The record may be put back on the web site at a later date.

The negotiations of the Fort Eustis Federal Facility Agreement (FFA) started in 1995. Several meetings and conference calls have been conducted in 1995. The agreement will spell out how Fort Eustis will interact with the USEPA and VDEQ throughout the cleanup process. The agreement will have a schedule in which Fort Eustis will have to adhere to. Stipulated penalties are also spelled out in the agreement. A draft FFA was submitted for regulatory review in June 2005. In addition to regulatory comments received in August 2005, EPA requested MMRP sites be included in the FFA. A signed FFA is expected in 2nd QTR FY06

There has been no Independent Technical Review of the installation.

The IRA for Brown's Lake started January 1999. The project involved excavating and placing contaminated sediment from an upper drainage area to the lake, placing a two-foot cap over the entire lake and modifying the outlet structure. The project was completed in October 1999 with the fish restocking. Post-IRA monitoring was conducted annually from 2000 to 2004. A follow-up FS was conducted to determine the remaining human and ecological risks after the lake was capped. A Draft FS was provided to Fort Eustis and the regulators in January 2003. The FS recommended Land Use Controls and LTM for 10 years. After regulatory comments were received, the Draft FS was revised to include additional excavation and storm water/sediment control measures as part of the final

action. A PP was finalized and a Draft ROD was submitted for regulatory review in July 2005. A signed ROD is anticipated in 2nd QTR FY06. A RD was awarded in January 2006.

In October 2001, the final FS was completed for Oil Sludge Holding Pond. The FS recommended excavation and off-site disposal of buried sludge. The ROD was signed in December 2002. The RA was initiated in January 2004 and completed in July 2004. A LTM contract was awarded in FY05. A Draft LTM Plan was submitted to the regulators in June 2005. The LTM Plan was finalized in January 2006.

In 2004, a project was awarded to address settling and drainage problems at Landfill 15. Repairs to the landfill included: removal of soil cover and liner; placement and compaction of fill material; installation of geo-grid and new liner; and a soil cover to return the area to final closure grade elevation. In the fall of 2004, upon completion of construction activities, Fort Eustis seeded the entire landfill with native vegetation to improve wildlife habitat, biodiversity, and minimize landfill maintenance.

IRP Cleanup Exit Strategy

Cap renovation construction activities were completed at Landfill 15 in September 2004. A total of 6.92 acres of cap area was removed and replaced. Fort Eustis initiated a Vegetative Management Program. Native vegetation was planted which lowers maintenance costs and provides food and habitat for many species. Yearly maintenance of the cap (i.e., mowing, over-seeding, erosion control, etc.) will continue throughout the life of the closed landfill. Long-term semi-annual groundwater monitoring will continue through 1st QTR FY06, at which time Fort Eustis will petition VDEQ to terminate groundwater monitoring. The methane gas-venting trench will passively vent throughout the life of the closed landfill. Monthly monitoring of the methane gas will continue.

Continue to operate passive SVE system at Landfill 7. Yearly maintenance of the cap (i.e., mowing, seeding, erosion control, etc.) will continue throughout the life of the closed landfill.

A groundwater and soil study was completed at the Firefighting Training Area to delineate groundwater contamination and data was used to determine the placement of new monitoring wells to be used during the Treatability Study. A FS will be completed to select the most appropriate technology for groundwater cleanup.

A FS and a PP were completed for the Brown's Lake Site. A draft ROD was submitted for regulatory review in July 2005. The Draft ROD presents the selected remedial alternative, which includes a removal action in the upper drainage ditch of the site, construction of a stormwater best management practice to control sediment accumulation in Brown's Lake, land use controls, and monitoring. LTM will be conducted for ten years. LTM will consist of annual surface water, sediment and fish samples taken every third year as proposed by the FS.

A FS is currently underway for both Bailey Creek and Eustis Lake sites. There are ongoing discussions with Fort Eustis, USAEC, and regulators regarding PCB Congener analysis. Regulators have requested additional sampling be conducted at Bailey Creek and the data be used to prepare a revised risk assessment. It is anticipated that land use controls, such as no fishing, will remain in affect. Ten years of LTM will be conducted before site closure is petitioned.

The Draft RI for the Felker Airfield Tank Farm recommends a FS be conducted. It is expected that the FS will recommend groundwater monitoring be conducted annually for five years as part of a monitored natural attenuation program. At the end of the five years, Fort Eustis will likely petition USEPA and VDEQ for NFA and site closure.

LTM will continue at the Oil Sludge Holding Pond, DOL Storage Yard, Helicopter Maintenance Area, and AAFES Service Station sites.

It is anticipated that the installation will request a NFA from the USEPA and VDEQ for the Milstead Island Creek and Third Port UST sites.

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- Final RA Report, DOL Storage Yard Site, Malcolm Pirnie, Sep-05
- Draft PP, Milstead Island Creek, Malcolm Pirnie, Oct-05
- Monitoring Report for the PCB Wetland Restoration Site in Bailey's Creek (DEC 05), US Fish & Wildlife Services, Dec-05

2006

- Final Long Term Monitoring Plan, Oil Sludge Holding Pond Site, Malcolm Pirnie, Jan-06

FORT EUSTIS

Installation Restoration Program
Site Descriptions

FTEUST-02
Inactive Landfill 15

SITE DESCRIPTION

Landfill 15 is a closed landfill located on the northern boundary of Fort Eustis adjacent to Bailey Creek. Landfill 15 began receiving wastes in 1972 as an unregulated trench landfill and reportedly received solid, hazardous and infectious waste. Disposed material also reportedly included domestic trash and garbage, sewage, sludge, incinerator ash and grease.

The initial landfill area ceased operation in 1980. On 3 January 1980, a 10.75-acre expansion was granted (Solid Waste Permit Number 289) by the Commonwealth of Virginia. The expansion for the permitted area stopped receiving waste in 1988. Operational closure occurred in 1988 and the site was graded. Construction of a cap started in 1993 and was completed in August 1994. Approximately 23 acres were capped with a synthetic liner of Very Low Density Polyethylene, drainage net, filter cloth and two feet of topsoil. In July 1995, Fort Eustis recorded the presence of the landfill in its deed. The recording indicates the site as a sanitary landfill permitted under Commonwealth of Virginia regulations. The deed annotation does not reference an acreage size. Final closure was granted by VDEQ on 22 February 1996.

STATUS

REGULATORY DRIVER: RCRA D

RRSE: Medium

CONTAMINANTS OF CONCERN: Metals

MEDIA OF CONCERN: Groundwater

Phases	Start	End
RFA	197706	197711
CS	198708	199007
RFI/CMS	198708	199007
DES	199009	199206
CMI(C)	199211	199408
LTM	199408	201409

RC DATE: 199408

Eleven passive gas vents and methane monitoring probes were installed in August 1994 to vent methane gas. In 1995, methane gas was detected on the compliance boundary of the landfill. To meet VDEQ requirements of one vent per acre, twelve additional gas vents were installed in August 1997. Construction of a gas-venting trench began in March 1998 and was completed in June 1998. The trench was installed to prevent gas migration to the compliance boundary. Nineteen methane gas probes were installed along the northern portion of the landfill to monitor the migration of gas. Sixteen probes are monitored monthly. No methane gas has been detected at the compliance boundary of the landfill since the gas-venting trench was installed.

In May 1999, as part of the installation of the gas-venting trench, Fort Eustis recorded the new boundary limits of the landfill as 25.219 acres. The boundary limits changed because the venting system had to be included within the acreage of the landfill. The cap size did not change.

Currently, semi-annual groundwater monitoring is being conducted as required by Virginia state regulations, Final Detection Monitoring for closed landfills. There are eleven groundwater monitoring wells around the landfill. Groundwater samples from five monitoring wells adjacent to Bailey's Creek are collected semi-annually and analyzed for

volatile organics and metals. The remaining wells are being used to verify groundwater gradients. An annual groundwater monitoring report is prepared and sent to VDEQ by March 1st of each year. During the October 2002 monitoring event, barium, chromium and lead were detected below maximum contaminant levels (MCLs).

Since the landfill was capped, the waste has been decomposing and the landfill has been settling. The original drainage patterns were changing. Virginia regulation states that post closure care shall consist of maintaining the integrity and effectiveness of the final cover, including making repairs to the cover as necessary to correct the effects of settlement, subsidence, erosion, or other events, and preventing run-on and run-off from eroding or otherwise damaging the final cover. Fort Eustis developed a grading plan and cost estimate for cap repair and maintenance to correct the settling. In FY01, a project was awarded to develop two alternatives to correct the settling and drainage problems. During the development of the alternatives, a conceptual cross-section of the landfill cap was produced to evaluate the effects of differential settlement of the synthetic liner. It was determined that differential settlement could be causing significant tensile stress on the liner as well as preventing proper subsurface drainage of water that infiltrates the landfill cap. Additional evaluation of the liner and development of more alternatives would have to be conducted. Funds for further evaluation were received year end FY02.

A project to correct cap settlement was awarded in FY04 and was completed in Sept 04. Repair procedures included the removal of soil cover and the liner system above and surrounding settlement swales; placement and compaction of fill materials into voids below the subgrade to the liner system; installation of a reinforcing geo-grid and liner system (low density polyethylene geo-membrane and geo-composite drainage net) and cap to return the area to final closure grade elevations and improve stormwater drainage; and installation of riprap slope protection to facilitate LTM activities. A total of 6.92 acres of cap area was removed and replaced. Fort Eustis initiated a Vegetative Management Program. Native vegetation was planted which lowers maintenance costs and provides food and habitat for many species.

CLEANUP STRATEGY

In accordance with VDEQ regulations, long-term semi-annual groundwater monitoring is required for ten years following closure certification issued 22 February 1996. Five groundwater-monitoring wells have been sampled semi-annually since 1996. The methane gas-venting trench will passively vent throughout the life of the closed landfill. Monthly monitoring of the methane gas in groundwater wells will continue along the northern perimeter of the landfill.

Yearly maintenance of the cap (i.e., mowing, over-seeding, erosion control, etc.) will continue throughout the life of the closed landfill. Groundwater and methane monitoring will continue. In 2006, Fort Eustis will submit a request to VDEQ to terminate long-

term groundwater and gas monitoring of the landfill. VDEQ will review the data and make a determination if additional monitoring will be required. Monitoring from 1996 to present has indicated no statistically significant contaminant concentrations above site background levels.

FTEUST-04
Area 3300 Landfill 7

SITE DESCRIPTION

Landfill 7 is located south and southeast of 3300 Block and adjacent the Warwick River. Landfill 7 is a non-permitted landfill because it ceased operation prior to VDEQ issuance of regulations in 1980, which required solid waste management permits. It was reported to have received waste from 1951 to 1972 and contains two specific areas. The eastern area (15 acres) received waste between 1951 and 1956, and reportedly received municipal solid waste, construction debris, and garbage. The western area (38.5 acres) received waste from 1956 to 1972 and is reported to contain miscellaneous refuse, including paints, oils, pesticide and herbicide containers, and infectious/pathological waste. Open burning was also conducted in the western area of the landfill. The discharge from Brown's Lake separates the eastern and western areas and flows into the Warwick River.

STATUS

REGULATORY DRIVER: CERCLA

RRSE: Medium

CONTAMINANTS OF CONCERN: Metals

MEDIA OF CONCERN: Groundwater, Surface Water

Phases	Start	End
PA	197706	197711
SI	197706	197711
RI/FS	198708	199007
RD	199009	199206
RA(C)	199211	199408
LTM	199409	202406

RC DATE: 199408

Initial studies began in 1977 with the installation of groundwater monitoring wells. Currently there are 17 groundwater-monitoring wells throughout the site. A groundwater monitoring program began in 1990. Construction of a cap was started in 1993 and completed in August 1994. Approximately 53 acres were capped with a synthetic liner of Very Low Density Polyethylene, drainage net, filter cloth and two feet of topsoil. Nineteen passive methane gas vents are constructed through the cap to vent gases. Groundwater monitoring ceased in 1997 after the installation determined that the landfill was in compliance with VDEQ regulations (VSWMR 9VAC 20 80), pertaining to management of unpermitted facilities. Surface water was also analyzed between 1993 and 1997 because of the proximity to the river.

During a 1995 monitoring event, methane gas was detected at points outside the boundary of the landfill and near several on-post warehouses. To protect the safety and health of the occupants of these buildings, a SVE system was installed and started operating in February 1998. The SVE system is designed to eliminate the migration of methane between the landfill and the buildings. Also in FY97, methane gas monitors with alarms were installed in the nearby five warehouses. Unsafe levels of methane gas have not been detected.

FTEUST-04
Area 3300 Landfill 7, cont.

CLEANUP STRATEGY

A regulatory review and evaluation of the post closure requirements will be pursued in FY06. Continue operation of the passive SVE system until it can be demonstrated that the concentration of methane gas at the landfill boundary does not exceed the Lower Explosive Limit. Gas monitors in warehouses will continue to be checked weekly to ensure they are operating properly. Yearly maintenance of the cap (i.e., mowing, over-seeding, erosion control, etc.) will also continue until 2024.

FTEUST-06
Fire Fighting Training Area

SITE DESCRIPTION

A Marine Fire Training Facility was located along Harrison Road at Building 2005 across from the eastern portion of the James River. The facility, built in 1968, included a smokehouse, office/storage/latrine building (Building 2005), aboveground burn tanks, burn pit, fuel feed system using underground piping, self-contained water conveyance/treatment system with underground piping and an oil/water separator. System operational years are unknown. The entire facility was abandoned in 1980. After the Marine Fire Training Facility was abandoned, the post fire department used the site for training until approximately 1990. Current activities at this site are limited to cargo and bulk item (non-POL) on/off-loading procedures and vehicle driver certification training. The oil/water separator was removed in November 1995.

RI fieldwork was initiated in 1990 to assess potential sources of contamination at the site. The results of this initial investigation revealed groundwater contamination with potential impacts to surrounding wetlands and ecological receptors.

STATUS

REGULATORY DRIVER: CERCLA

RRSE: Medium

CONTAMINANTS OF CONCERN: Chlorinated VOCs, Metals, PAH, BTEX

MEDIA OF CONCERN: Groundwater

Phases	Start	End
PA	198702	198808
SI	198702	198808
RI/FS	198909	200802
RD	200802	200902
RA(C)	200902	201012
RA(O)	201001	201412
LTM	201502	202403

RIP DATE: 201012
RC DATE: 201412

Additional focused field investigations were conducted in 1993 and 1994 to further characterize the site. Groundwater, surface water, soil and sediment samples were collected. The RI identified chlorinated VOCs [primarily tetrachloroethene (PCE), 1,1,1-trichloroethane, 1,1-dichloroethene and dichlorobenzene] and fuel-related compounds [benzene, toluene, ethylbenzene and xylenes (BTEX)] in the groundwater downgradient of the former fire pit area. Most of these constituents were well above the MCLs. The initial risk assessment identified no significant risks to potential human and ecological receptors mainly because the groundwater is not used as a drinking water source. The RI report recommended NFA at the site.

At the time the RI report was submitted, USEPA guidance was undergoing revisions for conducting ecological risk assessments. As a result of these revisions, there may have been potential data gaps in the 1994 risk assessment findings submitted by Fort Eustis. Fort Eustis, VDEQ and USEPA met in September 1998 to discuss the final RI report. In December 1998, USEPA sent Fort Eustis a follow-up letter disagreeing with the NFA recommendation and requesting additional information be gathered to fully characterize the site and assess the risk in accordance with current guidance. The USEPA recommended the following actions be conducted at the site:

- FS to address the contamination, including the installation of a deep monitoring well to address the possibility of contamination within the lower aquifer.
- Additional monitoring of groundwater and the marsh to ensure that the existing concentrations in the marsh and contaminants discharging from groundwater do not impact ecological receptors within the marsh.
- That toxicity tests be conducted to determine whether levels of contaminants in the surface water and sediment are causing adverse impacts to ecological receptors.

The FS was initiated March 2000. In 2001, a deep monitoring well was installed to determine if the constituents in the upper aquifer migrated to the lower aquifer. No contamination was detected in the lower aquifer. Additional groundwater, sediment and soil samples were collected throughout the site. Toxicity testing was also conducted at the site and a reference area was selected on post for background comparison.

After consultation with the USEPA and VDEQ, a treatment system will have to be installed to aggressively remediate the chlorinated VOCs in the groundwater. Additional groundwater monitoring wells were proposed along with geo-probe to better define the local geology at the site. A treatability study was awarded in FY02 to determine the most effective cleanup alternative. The additional information gathered as part of the treatability study will be part of the FS. A PP and ROD will then be prepared.

Field work for the future Treatability Study was initiated in the fall of 2004. The field work consisted of an initial groundwater and soil study using direct push technology (DPT), Membrane Interface Probes and Flexible Liner Underground Technologies to delineate dissolved and potential free-phase constituents.

CLEANUP STRATEGY

A sampling and analysis plan addendum, which included the installation of eight additional groundwater monitoring wells, was finalized in May 2005. These additional monitoring wells were installed in June 2005. The results from the Geoprobe and monitoring well investigations will form the basis of the Treatability Study.

Due to the high concentrations of chlorinated solvents, a combined approach applying thermal and bioremediation techniques may be used to reduce the majority of the contamination below 1,000 microgram/liter (µg/L). The FS will determine alternative technologies. Following finalization of a FS, a PP, ROD, and RD will be prepared.

FTEUST-19
Oil Sludge Holding Pond

SITE DESCRIPTION

The Oil/Sludge Holding Pond is located in the central portion of the installation near the intersection of Back River Road and Mulberry Island Road. In 1979, approximately 5,000 gallons of No. 2 fuel oil was accidentally pumped into a sanitary sewer clean-out connection. The fuel was collected at the sanitary sewage treatment plant by skimming it from the clarifier and diverting it to a sludge drying bed. A mixture of oil, digested sewage, and fuel residues were present in the sludge. The sludge was deposited in a 20-foot by 10-foot area and covered with soil.

In 1990, a PA/SI was conducted. The PA/SI results recommended a RI due to the detection of benzene, total petroleum hydrocarbons (TPH), chromium and lead above action levels. Then in 1993 and 1994, RI field efforts were initiated. Four groundwater-monitoring wells are located at the site. Groundwater, soil and sediment samples were collected and analyzed for VOCs, semi-volatile organic compounds (SVOCs), pesticides/PCBs and metals. Cone penetrometer technology was also used to identify the vertical and horizontal limits of the buried holding pond. The sludge is located approximately six feet below ground surface and is two to three feet thick within a 20 foot by 10-foot area. The total estimated sludge volume is ~20 cubic yards.

STATUS

REGULATORY DRIVER: CERCLA

RRSE: Low

CONTAMINANTS OF CONCERN: VOCs, BNAs, POL

MEDIA OF CONCERN: Soil, Groundwater

Phases	Start	End
PA	198909	199201
SI	198909	199201
RI/FS	199212	200110
RD	200206	200304
RA(C)	200304	200407
LTM	200407	200909

RC DATE: 200407

In 1995, a RI report was prepared. The report indicated that fuel-related VOCs, Base-neutral and Acid Extractable Compounds (BNAs) and Total Fuel Hydrocarbons – Heavy Fraction (TFH-H) were detected in soil and groundwater samples within and beneath the buried oil/sludge. Downgradient groundwater and soil samples were not contaminated. The conceptual model indicated no predominant transport pathways. Based on the qualitative human health and ecological risk assessments, no risks to potential human and ecological receptors were identified. The report recommended NFA. However, in a December 1998 USEPA letter, it was recommended that a FS be conducted to address potential ecological and human health risks. Surface soil values exceed ecological screening levels. USEPA's toxicologist and hydrogeologist had concerns about the potential future residential use of the groundwater and the potential for contaminated groundwater to migrate to the lower aquifer.

Based on USEPA's comments, Fort Eustis awarded an FS to address their comments. In October 2001, the final FS was issued and in November the PP was prepared. A public meeting was held on 6 December 2001 to allow the public the opportunity to comment on

the proposed action. The 30-day comment concluded on 31 December. No comments were received from the community.

Excavation and off-site disposal of unearthed buried sludge was the preferred cleanup action taken at the site. The ROD was completed in October 2002 and signed in December 2002. Fort Eustis awarded the RA contract in the third quarter of FY03. Initial excavation began in Dec 2003 and included the removal of ~50 cubic yards of contaminated soil and sludge. During the RA, significant amounts of concrete were encountered and the contaminant appeared to encompass a much larger area than identified in the RI. Soil borings were conducted to redefine the extent of contamination. Based on the soil boring results, the area of contamination increased to a 50 x 120 ft area with sludge up to six inches thick, located approximately six to eight feet below the ground surface. An additional RA contract was awarded in April 04 for this additional work and was completed in June 04.

A LTM Contract was awarded in FY05. One upgradient monitoring well was installed in November 2004 for future LTM and monitoring of the site.

CLEANUP STRATEGY

A RA Completion Report was prepared and submitted to USEPA and VDEQ. A Draft LTM Plan was submitted to the regulators in June 2005. The LTM Plan was finalized in January 2006. Per the ROD, LTM will be conducted for five years to ensure the previous detection of benzene is not impacting the site. Upon completion of LTM, the installation will petition for RC.

FTEUST-26
Helicopter Maintenance Area

SITE DESCRIPTION

The Helicopter Maintenance Area (HMA) facility is located in the 3300 Block off of Wilson Avenue. It is located adjacent to Brown's Lake (FTEUST-29) and consists of two buildings (Building 3301 and 3307) which are presently used to train military personnel in turbine engine maintenance. Associated with the facility is a JP-4 fueling system used in test runs of the repaired engines. A 12,000-gallon underground JP-4 jet fuel storage tank is located at the north end of Building 3307. The fuel is delivered to the building by an underground piping system which experienced a series of leaks between 1980 and 1987. The entire piping system was replaced in 1988. In 1998, the underground tank was removed and replaced with a 1,000-gallon AST. The piping was abandoned in place.

STATUS

REGULATORY DRIVER: RCRA I

RRSE: Low

CONTAMINANTS OF CONCERN: POL

MEDIA OF CONCERN: Soil, Groundwater

Phases	Start	End
ISC	198702	198805
INV	198702	198805
CAP	199005	199510
DES	199506	199510
IMP(C)	199510	199601
LTM	199601	200709

RC DATE: 199601

A site characterization was completed in August 1993 at the HMA facility to assess soil and groundwater contamination. The report was sent to VDEQ. Field investigations identified a Light Non-Aqueous Phase Liquid (LNAPL) plume as well as dissolved-phase contamination in the unconfined aquifer. The main area of subsurface contamination is located in the vicinity of Buildings 3307 and 3309. The site characterization also assessed the potential for future groundwater contaminant migration to Brown's Lake and the downgradient wetlands area. It was determined that the contaminants at the site were unlikely to impact either the wetlands or the lake. Based on these findings the site has been recommended for NFA with long-term monitoring. After reviewing the report, VDEQ requested a CAP be prepared to address the recovery of LNAPL.

The CAP was completed and submitted to VDEQ in August 1995. The CAP evaluated several remedial alternatives for the recovery of free product. The plan recommended the installation of a pneumatic recovery system in four monitoring wells and the installation of several passive bailers in wells with minimal LNAPL. VDEQ approved the system.

In December 1995, the recovery system was installed and in January 1996 the system was operating. Free product was to be removed from four groundwater recovery wells. After several months of operation, the initial automated system that was installed had problems in separating the fuel from the groundwater. To correct the problem, new in-well oil/water separator pumps were evaluated and purchased. These pumps are designed to prevent the recovery of the groundwater. In May 1996, the four monitoring wells were over-drilled to a greater depth and diameter so the new pumps could be installed.

In January 1998, the four free product recovery pumps were removed. This action was initiated due to diminished recoverable volumes. Passive bailers were installed in these wells, which are more cost effective in recovering the free product.

In December 1999, Fort Eustis and VDEQ met to discuss the past monitoring and free product recovery. VDEQ recommended approximately ten groundwater samples be collected from various monitoring wells to assess dissolved phase hydrocarbon concentrations and possible abandonment of selected monitoring wells throughout the site based on the collected data. In June 2000, 14 monitoring wells were sampled and in October, Fort Eustis sent VDEQ the sample results and recommendations for the abandonment of thirteen monitoring wells. VDEQ agreed with the recommendation and they were abandoned in 2001.

An analysis of monitoring data collected during 2002 showed an increase in the frequency and amount of product detected in several wells. After consultation with VDEQ, Fort Eustis proposed a modification to the CAP to more aggressively remove product from the wells. The CAP modification proposed that Fort Eustis perform monthly LVE events. The CAP modification was approved in April 2003 and LVE events are conducted on an as-needed basis. In the 2003 Annual Report, Fort Eustis recommended sampling 16 wells to determine if any were eligible for closure. The wells were sampled in Feb 2004 and results were sent to VDEQ. Based on discussion with VDEQ, 12 wells were recommended for closure. VDEQ responded with a letter on 19 Feb 2004 approving the closure of these 12 wells. In November 2004, the 12 monitoring wells were properly closed and abandoned per the approval of the VDEQ. Ten wells remain at the site and continue to be monitored monthly. Quarterly and annual groundwater reports continue to be generated for the site. As described in the CAP, aggressive monitoring and free product recovery will continue until less than 0.01 foot of product is detected in any of the remaining wells for six months (two consecutive quarters), a round of soil sampling will be conducted to verify site conditions. Based on current site conditions, Fort Eustis may petition VDEQ for an end to the monthly monitoring and closure of the remaining wells by mid 2006.

CLEANUP STRATEGY

Ten wells remain at the site and continue to be monitored monthly. Quarterly and annual groundwater reports continue to be generated for the site. As described in the CAP, aggressive monitoring and free product recovery will continue until less than 0.01 foot of product is detected in any of the remaining wells for six months (two consecutive quarters), a round of soil sampling will be conducted to verify site conditions. Based on current site conditions, Fort Eustis may petition VDEQ for an end to the monthly monitoring and closure of the remaining wells by mid 2006.

FTEUST-27
Milstead Island Creek Ditch Canal

SITE DESCRIPTION

Milstead Island Creek Ditch Canal is a man-made tidal waterway formed between the James and Warwick Rivers. This thoroughfare, originally Milstead Island Creek, was a natural waterway between Goose Island and the Warwick River.

In 1989, a RI was conducted at Landfill 7 (FTEUST-04) to collect twelve soil, sediment, and surface water samples from locations in Milstead Island Creek. Five additional soil/sediment and surface water samples were collected from Butler's Gut and the Warwick River. Samples were analyzed for VOCs, BNAs, pesticides/PCBs, metals and TFH. Trace levels of metals were detected in Milstead Island Creek surface water samples. These metals included aluminum, arsenic, barium, beryllium, copper, lead, selenium, thallium, and zinc. The investigation concluded that virtually no contamination was present in the surface waters investigated, including Milstead Island Creek, Butler's Gut, and the Warwick River.

STATUS

REGULATORY DRIVER: CERCLA

RRSE: Low

CONTAMINANTS OF CONCERN: Metals, POL

MEDIA OF CONCERN: Sediment

Phases	Start	End
PA	198802	198902
SI	198802	198902
RI/FS	198909	200608

RC DATE: 200608

In 1990, a RI was performed to characterize sediment samples along the creek, from the mouth of the James River to the beginning of Butler's Gut. Five sediment samples were collected and analyzed for VOCs, BNAs, pesticides/PCBs, Primary Pollutant metals, Extraction Procedures Toxicity metals, cyanide, and TFH. Suspected source areas included drainage from a sewage treatment plant and warehouses along Taylor Road. Samples collected along Milstead Island Creek exhibited trace levels of pesticides, PCBs, VOCs, BNAs, and total metals.

In 1993, four surface water samples were collected from Milstead Island Creek. The samples were analyzed for VOCs, BNAs, pesticides/PCBs, total and dissolved Target Analyte List (TAL) metals, TFH, and water quality parameters. No VOCs, BNAs or pesticides/PCBs were detected.

Selected TAL metals and TFH were detected. Isolated VOCs, BNAs and selected metals were detected in groundwater samples collected from Landfill 7. Landfill 7 was monitored quarterly and did not indicate significant contamination.

In 1995, a Draft RI report was prepared and sent to USEPA and VDEQ for review. The report identified limited contamination. There was localized fuel related and inorganic sediment contamination (zinc). Minimal risks to human health and ecological receptors were identified. Therefore, the report recommended NFA.

FTEUST-27
Milstead Island Creek Ditch Canal, cont.

In March 1996, Fort Eustis collected and analyzed 10 surface water samples from the creek. This was in response to ATSDR's pre-public Public Health Assessment that was prepared in February 1996. The surface water results were below the detection limits of 0.5 milligrams per liter. This information was sent to ATSDR for re-evaluation. In a December 1998 USEPA letter, a FS was recommended to assess the benthic community. Additional evaluation is required for final site closure and development of a ROD. Additional sampling focused on several areas with elevated concentrations of metals and TPH.

USEPA requested additional site evaluation with respect to ecological health of the creek. As such, a sampling and analysis program was initiated as part of this additional evaluation. Sediment samples were collected in fall 2002 for sediment toxicity, chemistry, and benthic analysis from three areas of Milstead Island Creek and from one reference area. The results of the sediment samples were incorporated into a draft ecological risk assessment which is currently under regulatory review. A Draft Supplemental Site Evaluation Report was prepared in December 2004. A Draft PP was submitted for regulatory review in October 2005. Fort Eustis is currently awaiting regulatory comments.

CLEANUP STRATEGY

It is anticipated that the installation will request a NFA from the USEPA and VDEQ.

FTEUST-29
Brown's Lake

SITE DESCRIPTION

Brown's Lake is a man-made lake constructed in the 1960s as a recreational pond located near the intersection of Wilson Avenue and Goodman Road, adjacent to Landfill 7 (FTEUST-04). The lake was named after Colonel Brown, a former provost marshal who was an avid outdoorsman and hunter.

The lake is constructed with an earthen dam and a concrete spillway. It collects stormwater from the helicopter maintenance area, the transportation motor pool, the locomotive storage yard, and the DPW compound. It discharges to an intermittent stream/wetlands area just to the south that eventually feeds into the Warwick River. The lake is roughly triangular in shape and its total surface area is approximately 2.5 acres. Maximum lake water depth is 10.9 feet.

STATUS

REGULATORY DRIVER: CERCLA

RRSE: High

CONTAMINANTS OF CONCERN: Pesticides, PCBs, BNAs

MEDIA OF CONCERN: Sediment

Phases	Start	End
PA	198705	198708
SI	198705	198708
IRA	199809	199910
RI/FS	198909	200509
RD	200509	200608
RA(C)	200602	200708
LTM	200708	201609

RC DATE: 200708

A 1982 water quality biological study of the lake indicated excess plant nutrients, causing algal blooms and thus oxygen depletion in the subsurface waters. Also, the unusual texture of the sediments (unsuitable for benthos) and the visibly diseased fish (fungus) indict that the lake should remain off limits to fishing, pending further study. During a follow-up study in 1985, the water and sediments were sampled. Trichloroethylene, trichloro-trifluoroethane and 1,2-dichloroethane were detected in the sediments but not in the water. Fish samples were analyzed to determine at what level these compounds were present but none of the above compounds were detected.

In 1987 another water quality biological study was conducted. Sediment samples were collected. The study stated the environmental stress is probably related to the former discharge of the locomotive shop wastewater that has left organic compounds trapped in the sediments. The study also recommended keeping the lake off limits for fishing.

This site was investigated due to its close proximity to the HMA site, which experienced leaks in an underground piping system between 1980 and 1987. Previous investigations indicated that contamination from the HMA might be migrating to Brown's Lake via groundwater and through a storm water ditch, which discharges into Brown's Lake. However, findings from the Site Characterization for the HMA indicated that past releases of JP-4 fuel at the HMA are not the source of contamination detected in Brown's Lake.

A total of 24 sediment samples were collected from upgradient, downgradient and the bottom of the lake. Thirteen surface water samples were also collected. These samples were taken during three separate sampling events conducted in 1987, 1990, and 1993.

FTEUST-29
Brown's Lake, cont.

Sediment samples are characterized as having elevated concentrations of pesticides, PCBs, BNAs, TFH, and some metals.

In February 1997, a Final RI report was completed and submitted to the USEPA and VDEQ. The report indicated that the sediment contamination resides in the upper sediment zone (approximately two feet). The data indicated no surface water contamination. Although institutional controls have been implemented, a risk to human health is still evident based upon a completed exposure pathway of trespassers and site workers. The ecological risk assessment determined that a significant potential for risk to aquatic receptors and moderately high risk to higher order predators exists. The report recommended a FS be conducted at the site. This recommendation was based primarily on the detection of PCBs, BNAs, Dichlorodiphenyltrichloroethene (DDT) and Dichlorodiphenyldichloroethane in the lake sediments.

In May 1997, a Draft Engineering Evaluation/Cost Analysis was completed for an IRA. In September 1998, the IRA was awarded and construction started in January 1999 and was completed in October 1999. The project included the following:

- Draining the entire lake
- Excavation of sediments from the upper drainage ditch
- Placement of sediments in the deeper portion of the lake
- Capping the bottom of the entire lake with two feet of clean fill
- Lake restoration to include fish stocking

A FS and a monitoring contract were awarded in FY98. Sampling has been conducted annually since the IRA, and data is submitted in post-IRA Monitoring Reports. The Draft FS was received for review in January 2003. The FS evaluated the effectiveness of the IRA, and recommended Land Use Controls and monitoring for a period of ten years. The regulators recommended additional excavation of the upper ditch and stormwater sediment control technology prior to LTM. The USEPA also requested additional study, based on post-IRA concerns. The FS was finalized in May 2005. A PP was prepared and available for a 30-day public comment period during August 2005. A Draft ROD was submitted to USEPA and VDEQ for review and comment in July 2005. Several revisions to the ROD have been made addressing regulatory comments. Fort Eustis anticipates signing the ROD by February 2006. A RD contract was awarded in February 2006. The RD will consist of two separate documents – a RD for the action and a RD for the land use controls. Fort Eustis expects to award the RA contract during FY06.

In the last ten years, Fort Eustis has taken an active role in preventing future releases into the lake from the surrounding industrial areas. An oil/water separator was installed at the locomotive yard and now discharges its water to the sanitary sewer. Three new wash racks equipped with water recycling systems are now in use. USTs and dispensers at an old military gas station have been removed along with several heating oil tanks in the area. All these tanks had the potential to discharge fuel oil, diesel and gasoline into the lake.

CLEANUP STRATEGY

LTM will be conducted for ten years. LTM will consist of annual surface water, sediment and fish samples taken every third year as proposed by the FS.

FTEUST-30
Bailey Creek

SITE DESCRIPTION

Bailey Creek is a one to two mile meandering tidal creek, which discharges to Skiffes Creek. It is located on the northern boundary of Fort Eustis where it borders the southern boundary of Inactive Landfill 15 (FTEUST-02). The headwaters of Bailey Creek are located in the target area of the former skeet range. There are wetland areas adjacent to Bailey Creek channel along both sides of the creek. Site #9, Building 801 Central Heat Plant (FTEUST-21), is located along southern side of the creek.

Based on the RI, the most likely source of the PCBs was determined to be releases from transformers transported via stormwater. Fort Eustis began a formal program to remove PCB contaminated transformers or replacing them with non-PCB transformers in 1978, which has been completed.

STATUS

REGULATORY DRIVER: CERCLA

RRSE: High

CONTAMINANTS OF CONCERN: PCBs

MEDIA OF CONCERN: Sediment

Phases	Start	End
PA	198701	198706
SI	198701	198706
IRA	199906	200004
RI/FS	198909	200907
LTM	200907	201808

RC DATE: 200907

In 1987, a water quality biological study was conducted at Bailey Creek to determine whether Landfill 15 was adversely affecting the water quality and biota of the creek. During this study, chromium and mercury were detected at slightly elevated concentrations in surface water samples taken downstream of the landfill. Lead was also detected at a slightly elevated concentration in a surface water sample located downstream of a skeet range. PCBs were detected at low levels in sediment samples taken downstream of the landfill. It was determined that the landfill was not the source of the contamination.

In 1990, a RI was conducted to assess sediment contamination present along Bailey Creek to further identify the source of the contaminants. A total of 26 sediment samples were collected from the mouth of Skiffes Creek to the interior of Bailey Creek. The nature of contaminants at Bailey Creek was characterized as having significant concentrations of PCBs, TFH-H, and lead. Analytical results indicated elevated levels of these contaminants in localized areas along the creek, and the contamination in these localized “hot spots” within Bailey Creek may pose risks to human health and the environment. Elevated levels of lead were also detected above screening values in the sediments near the skeet range.

In 1993 and 1994, RI field efforts were also conducted. A total of 132 sediment samples, including duplicates, were collected from Bailey Creek and the Site #9 Central Heating Plant area and field-screened for PCBs. Fifty-eight of the sediment samples were also analyzed for Pesticides/PCBs, TFH-H, TAL metals and Total Organic Carbon. Catfish, killifish/minnows and crabs were also collected and analyzed for PCBs and lead. It was determined that the Heating Plant was not the source of PCB contamination.

In January 1995, a Draft RI report was sent to the USEPA and VDEQ for review. The report indicated that Aroclor 1260, TFH-H and BNA were the predominate contaminants at the site. The extent of the PCB contamination, as defined by a concentration of one milligrams/kilogram, covers approximately 18 acres.

It also identified the skeet range as the source for the lead contamination. The lead area covers approximately 11 acres. The specific source of PCB contamination has not been identified, although the data collected indicates the initial source was most likely from a one-time release within the storm drainage system leading to Bailey Creek.

Monitoring of the surface water and sediment for PCBs and lead was conducted between October 1995 and May 1998. The project consisted of six semi-annual monitoring events. The main object of the project was to see if the contamination was migrating over time. Results indicated that there was lateral migration of PCBs within Bailey Creek.

An IRA was initiated in December 1999 and completed June 2000. 6,637 tons of PCB-contaminated sediments were removed and disposed off site. The site was back filled to original elevations with clean fill and revegetated with wetland plants. In the spring of 2001, 41 additional sediment samples were collected and analyzed. Clams and mummichogs were also collected and analyzed from four locations within Bailey Creek. A revised risk assessment was conducted as part of the FS since the IRA did not remove all the contaminated sediments. The IRA report was finalized in April 2003.

The draft FS was provided for regulatory review in June 2003. VDEQ comments were received in March 2004 and USEPA comments were received in April 2004. USEPA has requested additional sampling to identify potential secondary sources, to include sediment sampling within the upper drainage ditch and storm sewer outfall for total PCBs.

A ROD will be developed after the FS is completed.

CLEANUP STRATEGY

Additional sampling will be conducted as part of the FS. Results will be used to screen and select remedial alternatives. It is anticipated that institutional controls (no swimming, fishing or wading in Bailey Creek) will be a component of the remedy. LTM will include monitoring of sediment on an annual basis, and fish and clams every three years. Based on the review of the monitoring data, additional response may be considered.

USEPA has requested additional sampling of PCB congeners to identify potential secondary sources, ecological risk and future health concerns. Previously, PCB aroclor sampling analysis has been completed. Potential sediment sampling for total PCBs may take place along the upper drainage and areas adjacent to the stormwater drainage outfall. Comments related to the congener sampling are still being considered by the USAEC and USEPA.

FTEUST-32
Felker Airfield

SITE DESCRIPTION

The Felker Airfield Tank Farm facility supports all aviation fueling activities for Felker Army Airfield. The facility is located at the intersection of Mulberry Island Road and Condon Road across from the golf course clubhouse Building 3501. The facility encompasses a fenced area of approximately 50,000 square feet (250 by 200 feet). Important structures at the site, included two 30,000 gallon ASTs, a storage shed, a tanker off-loading and refueling pad, two underground pipes between fueling islands and the ASTs and a concrete containment pad for parking refueling vehicles. The storage shed is located in the western corner of the site while the two ASTs are located on the southeast end of the site. The ASTs are cylindrical and are surrounded by secondary containment berms, which are approximately 4 feet in height. The ASTs were replaced with two new 30,000 gallon ASTs in 1999. The two fueling pads are located next to the storage shed on the western side of the site.

STATUS

REGULATORY DRIVER: CERCLA

RRSE: Medium

CONTAMINANTS OF CONCERN: Metals, Pesticides, SVOCs

MEDIA OF CONCERN: Soil, Groundwater

Phases	Start	End
PA	199202	199210
SI	199202	199210
IRA	199303	199406
RI/FS	199212	200804
LTM	200805	201208

RC DATE: 200804

Fort Eustis personnel suspected historical problems of leaking underground fuel lines from two ASTs, which would release fuel into the surrounding soil.

In August of 1992, a PAS was initiated to characterize potential soil and groundwater contamination. Analytical results indicated that BTEX, along with TFH-L, were present in the soil. In addition, six feet of free product was measured in a temporary well point.

An IRA was initiated in 1993 and was completed in June 1994 to address the six feet of free product. A 100 foot free product recovery trench and sump was to be installed after 5,000 cubic yards of contaminated soil were excavated. However, during the removal of contaminated soil, no free product was encountered. The recovery trench and sump were never installed. Approximately 3,800 cubic yards of petroleum-contaminated soil was removed and treated at a bioremediation cell on Fort Eustis. The fueling system and associated piping was also removed and replaced. A concrete containment system was constructed around the two 30,000 gallon aboveground fuel tanks.

In 1993 and 1994, field efforts were conducted to delineate the contamination at the site. Since the site consists of ASTs, a Site Characterization was required to meet VDEQ UST regulations. Eight monitoring wells were installed and sampled for pesticides/PCBs, VOCs, BNAs, total and dissolved metals and TFH. DPT was also used to collect groundwater samples for field screening and placement of permanent wells. Nine soil samples were collected at nine locations and three sediment samples were collected from the wetland area. The soil and sediments samples were submitted for pesticides/PCBs,

VOCs, BNAs, total metals and TFH analysis and three surface water samples were also collected. No free product was detected in the monitoring wells during the characterization phase.

The following are the constituents found in the groundwater: PCE (32 ug/L at one well), benzene (13 and 320 ug/L), ethylbenzene (2.4 and 400 ug/L), toluene (4.6 ug/L), 1,1,1-Trichloroethane (6.1 ug/L), Xylene (1.0 - 48 ug/L). No pesticides/PCBs were detected. BTEX related compounds were detected in several of the soil and sediment samples. Based on the initial qualitative human health and ecological risk assessment, insignificant potential risk to human and ecological receptors existed at the site at the time. NFA was recommended.

The UST division of VDEQ approved the NFA recommendation. In May 1996, the Federal Facilities Section of VDEQ sent Fort Eustis a letter stating that 'they did not support the NFA recommendation due to the presence of constituents besides fuel-related compounds'. USEPA also expressed the same concerns.

In January 2001, Fort Eustis developed a scope of work for additional RI work and a FS. The RI/FS was awarded in 2nd quarter FY01. USEPA and VDEQ reviewed the work plans and requested additional samples and chemistry be collected. Funds for the additional samples were requested in July 2002. In October of 2002, six new monitoring wells were installed and groundwater samples were collected from six existing wells. Two of the original eight existing wells are damaged and not suitable for sampling. Eight surface and subsurface soil samples, as well as seven sediment samples, were collected for analysis.

The draft RI was submitted for regulatory review in Feb 2004. A quantitative evaluation of the potential current and future risk to human health and environment from exposure to contaminated media was conducted as part of the RI. Results of the risk assessment indicated slightly elevated risk to potential future residential groundwater users as well as potential ecological receptors to site soils. Regulatory comments were received in FY04 and are currently being addressed.

CLEANUP STRATEGY

The FS will consist of the development of remedial cleanup alternatives and the detail analysis of them. A PP and ROD will be prepared to close out the site.

In 2008, it is expected that the FS will recommend that 12 groundwater wells be sampled annually over the next five years for SVOCs, VOCs, metals, pesticides, total suspended solids and total dissolved solids as part of a LTM program. Five soil and five sediment samples will be collected and analyzed for metals as part of the LTM program. At the end of the five years, Fort Eustis will likely petition USEPA and VDEQ for NFA and site closure.

FTEUST-33
Third Port UST

SITE DESCRIPTION

This is a UST site located near the Fort Eustis port facility behind Building 460. This site was identified in 1982 as part of the installation-wide assessment. The site consisted of a wash rack area and a 1,000 gallon capacity UST. The wash rack area was covered by a concrete pad (approx. 10 ft by 20 ft), an attached concrete secondary containment berm and a drainage grate located near the center of the pad. The UST was located approximately 15 to 20 feet away. It appears that residual water and grit from the wash rack drained to the UST. A pipe leading from the UST may have been used to drain the tank; however, the exact use of the site is unknown. The UST appears to have drained onto surface soils adjacent to Bailey Creek.

STATUS

REGULATORY DRIVER: CERCLA

RRSE: Low

CONTAMINANTS OF CONCERN: Metals

MEDIA OF CONCERN: Soil

Phases	Start	End
PA	199410	199503
SI	200008	200605

RC DATE: 200605

The UST removed in March 1994 along with 12 cubic yards of soil. Two soil samples were collected from the bottom of the excavation and analyzed for TPH. The results were below VDEQ's UST Program action limit.

In October 1994, a site screening sampling event was conducted. Four surface and three subsurface soil samples were collected in the vicinity of the former UST and wash pad. The samples were analyzed for VOCs, SVOCs, pesticides/PCBs and metals. Vanadium was the only constituent detected above USEPA's Risk Based Concentrations. Soils from the discharge point have not been characterized nor have groundwater samples been obtained.

A more comprehensive SI was conducted in lieu of proceeding directly to the RI phase. It is assumed by doing this comprehensive SI the results will support a request for a NFA. However, the SI findings may necessitate a RI. In January 2001, a final sampling and analysis plan was prepared and fieldwork activities were conducted in March. Four groundwater monitoring wells were installed and soil samples were collected during well installation. In November 2001, the draft SI report was sent to the USEPA and VDEQ for review and comments were received in January 2002. Several metals were detected throughout the site above screening levels. USEPA and VDEQ have raised the issue of metals above the screening levels and how background concentrations are developed. Addition evaluation of the metals will have to be included in the SI report in order to justify the SI recommendation of no further investigation are warranted.

A contract was awarded year-end FY02 to perform a Screening-Level Risk Assessment (human health and ecological) using the data generated during the SI field investigations. The assessments include the calculation of hazard quotients and cancer risk to assess the risk to human health and compare exposure concentrations to ecological end points. In June 2003, the draft risk assessment was provided to USEPA and VDEQ for comment.

FTEUST-33
Third Port UST, cont.

Comments were received from VDEQ in July 2003 and USEPA in Aug 2003. Numerous discussions have been held with the regulatory agencies to clarify and address these comments. Response to comments and a revised draft risk assessment were submitted for regulatory review in July 2005. Additional VDEQ comments were received in October 2005, which addressed the Commonwealth's policy to return all impacted state waters (including groundwater) to their maximum beneficial use, i.e., as potential potable water sources.

CLEANUP STRATEGY

Fort Eustis is currently addressing VDEQ comments regarding their policy to return all impacted state waters to their maximum beneficial use. Anticipate submission of a revised SI by March 2006.

FTEUST-34
DOL Storage Yard Bldg 1607

SITE DESCRIPTION

This site is located at the southeast corner of Patch Road and Wilson Avenue across from building 1607. The site includes a 310 by 110 foot fenced storage yard which was previously used by the military as an equipment storage area. The site also includes adjacent woodland, stormwater drainage ditches, and a wooded wetland adjacent to the Wilson Avenue culvert. The site was formerly used to store pesticides/herbicides for the entomology shop in the late 1970s and early 1980s. The storage yard drains into ditches along Wilson Avenue, through a culvert, and into a wooded wetland. Then the Directorate of Logistics (DOL) used it for storage of building material and supplies for the installation until 1997. Transformers were stored in the yard-awaiting disposal. Lightning apparently struck one oil switch transformer and its contents were released onto the ground. This action was the cause of the initial investigation. In November 1993, soils were sampled to assess the extent of the transformer release. PCBs and DDT were detected in the soil samples.

STATUS

REGULATORY DRIVER: CERCLA

RRSE: Medium

CONTAMINANTS OF CONCERN: PAHs, Metals, Pesticides

MEDIA OF CONCERN: Soil, Groundwater, Sediment

Phases	Start	End
PA	199310	199408
SI	199310	199408
RI/FS	199408	200107
IRA	199704	199707
RD	200107	200206
RA(C)	200207	200307
LTM	200308	200809

RC DATE: 200308

In August 1994, a RI was initiated. Soil, sediment, surface water and groundwater samples were collected. Thirteen groundwater monitoring wells are located throughout the site. A draft RI was prepared in May 1997. PAHs, pesticides and metals were detected in site soils and sediment, and lindane and VOCs were detected in the groundwater. Findings of the risk assessment indicated a potential risk to human health and the environment through exposure to contaminated sediments, soil, and groundwater. Comments on the draft RI were received from USEPA and VDEQ. These comments addressed the risk assessment selection criteria. Responses to comments were submitted to USEPA and VDEQ in FY00.

In July 1997, an IRA was initiated to eliminate the soil exposure pathway. The storage yard was capped with four inches of stone and two inches of asphalt.

In FY98, a FS was awarded. The project included the development of remedial alternatives and detailed evaluation of these alternatives. Both the RI and FS were completed in July 2001. The RI indicated a potential for adverse health effects for residential population due to exposure to contaminated soils, sediment, and surface water and a potential for adverse health effects for Fort Eustis site workers. There was also a potential risk of exposure to several pesticides and inorganics for mammalian and avian species. Risks were also identified for plants and invertebrates within the sub-sites. The FS evaluated several cleanup alternatives and the PP outlined the preferred alternative, which was excavation and off-site disposal. Since there is the possibility of future

construction of a warehouse at the site, the soil beneath the asphalt storage yard will be excavated and removed. Additional soil and sediment sampling was conducted in August 2001 to further delineated the lateral and vertical extent of contamination. The results of the sampling greatly reduced the area and volume of soil and sediment that needs to be removed, thus reducing the RA cost.

In July 2001, the PP was issued and the 30-day public comment period started on 29 July and concluded on 31 August. A public meeting was held on 14 August. No significant comments were received. The ROD was signed 28 September 2001.

The RD was awarded in FY01 and the RD memorandum was finalized in August 2002. The RA was initiated in December 2002 and field work was completed in July 2003. The RA consisted of excavation and off-site disposal of 5,200 tons of contaminated soil and sediment and site restoration.

A contract was awarded in June 2003 for the preparation of a LTM plan and the first year of annual monitoring. Five groundwater monitoring wells will be sampled annually and analyzed for total and dissolved metals. Surface soil samples will be collected annually from 10 locations and analyzed for pesticides and PAHs.

The Draft RA Completion Report was submitted in Dec 2003. Comments were received and incorporated into a Final RA Completion Report, which was provided to USEPA and VDEQ for review and concurrence in September 2005.

In November of 2004, the US Fish and Wildlife Service planted trees on the site to reestablish previously removed natural vegetation along a drainage swale to the northwest of the site. The first round of LTM sampling was conducted in FY05.

CLEANUP STRATEGY

LTM sampling will be conducted for a total of five years. Costs for the Installation-wide five-year review to occur FY06 are contained in the cost estimates for this site.

FTEUST-35
AAFES Service Station

SITE DESCRIPTION

AAFES Service Station is located at Building 1380 at the intersection of Washington Blvd and Jackson Avenue. During a UST closure confirmation sampling event in July 1992 of the waste oil tank (FTEUST-22), unidentified petroleum contamination was observed in the sediment. The contamination was thought to be from past leaks from the active six 10,000 gallon Gasoline USTs at the Army, Air Force Exchange Service (AAFES) Service Station. The USTs were installed in the late 1960s and were fiberglass lined in the November 1997. Tank tightness tests and tank inspections are conducted regularly on the USTs and recent tests indicate the tanks are not leaking. This site is regulated and administered under the Virginia UST program.

A site characterization was initiated in December 1992. Three borings were advanced near the removed UST and three monitoring wells were installed. One of the wells had approximately 1.5 feet of free product. The Site Characterization Report (SCR) recommended a more detailed subsurface investigation to locate the source of the release, to delineate the contamination plumes, and to determine the remediation technologies.

STATUS

REGULATORY DRIVER: RCRA I

RRSE: Medium

CONTAMINANTS OF CONCERN: POL

MEDIA OF CONCERN: Soil, Groundwater

Phases	Start	End
ISC	199207	199210
INV	199207	199210
CAP	199211	199603
DES	199604	199609
IMP(C)	199609	199610
IMP(O)	199611	200401
LTM	200402	200909

RIP DATE: 199611
RC DATE: 200401

In November 1993, five additional monitoring wells were installed to further delineate the subsurface petroleum hydrocarbon contamination. In December 1993, an Expanded SCR was submitted to VDEQ. Free product was detected in several wells. The lateral extent of the dissolved phase contamination plume was not fully delineated. The report did not recommend a remedial cleanup alternative. Three wells were installed in February 1994 as part of the recommendation of the proposed CAP.

In December 1994, three additional wells were installed, bringing the number of monitoring wells to 14. As part of the CAP, an electromagnetic survey (EM-61) was performed over the site to determine if unknown USTs existed on-site. No other USTs were discovered. Groundwater samples were also collected at four different locations using DPT. The CAP recommended an aggressive bailing program be instituted. A CAP was submitted to VDEQ in May 1995.

VDEQ reviewed the CAP but did not approve it because Fort Eustis proposed only hand bailing the wells. They approved a six month hand bailing and monitoring activity. Several wells were hand bailed daily and gauged weekly for free product/groundwater level. The

six-month period was completed in January 1996. Soil and groundwater sampling was conducted and a CAP Addendum was sent to VDEQ in April 1996 for approval.

In September 1996, nine four inch monitoring wells were installed to accommodate the pneumatic pumps in an automatic recovery system. The system started operation in October 1996. Two additional monitoring wells and pumps were activated in January 1997.

An analysis of monitoring data collected during 2002 showed an increase in the frequency and amount of product detected in several wells. After consultation with VDEQ, Fort Eustis proposed a modification to the CAP to more aggressively remove product from the wells. The CAP modification proposed that Fort Eustis perform monthly LVE events. VDEQ requested that Fort Eustis submit a Final CAP for approval after LVE events had been conducted for three months. The final CAP modification was approved in April 2003.

In the 2003 Annual Report, Fort Eustis recommended removing the automatic recovery system as it no longer operated properly. VDEQ agreed and the system was shut down on 21 Jan 2004.

Actions from 2004 included monthly LVE events and the use of passive skimmers and absorbent socks to remove traces of free-product from the monitoring and recovery wells. During the fourth quarter of 2004, four wells were sampled to establish a general age determination and product characteristics. The sample results suggested that the product sampled is semi-degraded gasoline with high concentrations of BTEX. According to the age determination sampling report, a portion of the free-product (based on sample locations on the site) was recognized as being 'unweathered.' As of December 2005, gauged amounts of free product have declined significantly in all of the wells. Generally, trends at the site show a continued decrease in overall product gauged in the monitoring wells, which is a result of a more efficient extraction scheme that has increased the amount of free product being removed. Approximately 2700 gallons of free product have been recovered to date. The possible closing and demolition of the current service station, removal of the USTs and the reopening of a newer facility, either at the current location or a different location, are being considered by AAFES Management.

Current actions include monthly LVE events, absorbent sock usage between LVE events and groundwater monitoring. Quarterly and annual groundwater reports are generated. This is expected to continue through FY09.

CLEANUP STRATEGY

Monthly LVE events and absorbent sock implementation continue to recover free product from the site. Upon completion of the LTM (FY09), Fort Eustis will request NFA.

FTEUST-36
Eustis Lake

SITE DESCRIPTION

The man-made 45-acre lake is located in the middle of Fort Eustis. The lake was constructed between 1953 and 1956 and has an average depth of four feet with a maximum depth of eight feet. The lake is used for recreational fishing and boating; however, swimming is not allowed. The lake receives stormwater from numerous industrial, barracks and wooded areas. The two concrete spillways drain into a tidal wetland adjacent to the James River. The Matthew Jones House, a historical site, is located on the northern bank of Eustis Lake.

STATUS

REGULATORY DRIVER: CERCLA

RRSE: High

CONTAMINANTS OF CONCERN: PAHs, Metals, Pesticides

MEDIA OF CONCERN: Soil, Groundwater, Sediment

Phases	Start	End
PA	199503	199509
SI	199503	199509
RI/FS	199510	200611
LTM	200611	201510

RC DATE: 200611

During the RI for Brown's Lake (FTEUST-29), 13 fish from Eustis Lake were collected and analyzed for PCBs, pesticides, PAHs and metals. The fish tissue samples were intended for background comparisons for the Brown's Lake RI; however, due to the detection of PCBs in the fish, the data could not be used for comparisons. This prompted Fort Eustis to contact the US Army Center for Health Promotion and Preventive Medicine (USACHPPM).

In April 1995, USACHPPM collected 59 fish from six different species (white catfish, largemouth bass, black crappie, gizzard shad, bluegill sunfish and carp), 13 surface water samples and 13 sediment samples. This effort was part of a Human Health Risk Assessment for a Fish Consumption Advisory. All the samples were analyzed for PCBs and DDT. Based on the human health risk assessment, PCB concentrations posed unacceptable potential non-cancer and cancer risks. USACHPPM recommended instituting advisories or bans to all edible species present in the Lake.

Based on the Draft RI Report for Brown's Lake, USACHPPM's Human Health Risk Assessment and ATSDR's recommendation, Fort Eustis instituted a catch and release policy in June 1995.

In December 1995, a RI was conducted to characterize the nature and extent of contamination in Eustis Lake, assess the risks to human health and the environment and make recommendations for future actions at the site. The RI work plans were reviewed and approved by the USEPA and VDEQ. In November 1996, field efforts started. Sediment, soil, surface water and fish tissue samples were collected. An on-site laboratory was used during the characterization stage of the lake to identify hot spots. Pesticides, PCB congeners and metals were detected in fish tissue samples. The draft report recommended an FS based on the results of the risk assessment, which indicated potential risks for human health and ecological populations. Based on the RI, the most likely source of the PCBs was determined to be releases from transformers transported via stormwater. Fort Eustis began a formal program to remove PCB contaminated

transformers or replace them with non-PCB transformers in 1978. In May 1998, the Draft RI report was sent to the USEPA and VDEQ for review. USEPA and VDEQ requested 100% data validation of the sampling results and additional fish tissue and sediment samples. The RI was finalized in July 2003.

In February 1997, the FS was awarded. The FS was conducted to evaluate potential source areas (stormwater pipes), evaluate remedial alternatives and for development of a ROD. In pre-draft FS, Fort Eustis environmental contractor recommended cleaning and improving of the existing storm water sewer pipes, construction of new drainage pipes, and construction of sedimentation basins (capital cost $257K). A draft FS recommending fishing restrictions and long-term monitoring was submitted in February 2003.

Comments generated from the Draft FS recommended additional fish and sediment sampling. Additional sampling has been conducted and results will be incorporated into the FS.

CLEANUP STRATEGY

It is anticipated that the FS will recommend a catch and release and risk management monitoring program to establish an assessment baseline, and may include a sediment removal action. LTM and catch and release recreational fishing will continue for a period of 10 years. Annual monitoring of sediments and surface water and fish samples every three years. At that time, reassessment of the monitoring data will be conducted to determine the scope and magnitude of future LTM. It is expected that institutional controls will be a permanent remedy for this site (installation policy of catch and release and no swimming).

Costs for the Installation-wide five-year review to occur FY11 and FY16 are contained in the Cost Estimates for this site.

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IRP NFA Sites Summary

AEDB-R #	Site Title	Documentation/Reason for NFA	RC Date
FTEUST-01	OFFICER'S CLUB LANDFILL	Based on the data collected, Landfill 1 was evaluated with respect to Open Dump Evaluation Criteria (Appendix 4.1 of 9 VAC 20-80-180 of the Virginia Solid Waste Management Regulations) and was determined to be in compliance and further monitoring was required. NFA is programmed under the IRP.	198812
FTEUST-05	OPEN BURNING INCINERATOR	In June 2000, Fort Eustis met with VDEQ and USEPA to discuss the status of the site for final closure. VDEQ and USEPA requested four soil samples be collected at two locations and analyzed for TAL Metals, TCL VOCs, TCL SVOCs and Pesticides/ PCBs. Based on the results Fort Eustis requested NFA for the site.	198803
FTEUST-08	SEWAGE TREATMENT PLANT	Since the Sewage Treatment Plant operated until December 1999, it is not an eligible IRP site. No further actions are programmed under the IRP. Sewage Treatment Plant has since been demolished.	198809
FTEUST-09	HOSPITAL INCINERATOR	Since the hospital incinerator currently operates under a permit issued by the Commonwealth of Virginia and is currently in operation, it is not an eligible IRP site. NFA are programmed under the IRP.	198809
FTEUST-10	RANGE IMPACT AREA	Since the site is currently an active range, management of it will be under the Department of Defense Range Rule and is not an eligible IRP site. NFA is programmed under the IRP.	198809
FTEUST-11	GOOSE ISL. DREDGE SPOILS (SITE 5)	Sediment samples collected at these sites did not contain pesticides or kepone at levels that would warrant further investigation. Therefore, NFA was recommended for these sites. The Final PA/SI was published in January 1992.	199201
FTEUST-12	MULBERRY ISLAND DREADGE SPOILS (SITE 12)	Sediment samples collected at these sites did not contain pesticides or kepone at levels that would warrant further investigation. Therefore, NFA was recommended for these sites. The Final PA/SI was published in January 1992.	199201
FTEUST-13	MULBERRY ISLAND DREDGE SPOILS (SITE 13)	Sediment samples collected at these sites did not contain pesticides or kepone at levels that would warrant further investigation. Therefore, NFA was recommended for these sites. The Final PA/SI was published in January 1992.	199201

AEDB-R #	Site Title	Documentation/Reason for NFA	RC Date
FTEUST-14	MULBERRY ISLAND DREDGE SPOILS (SITE 14)	Sediment samples collected at these sites did not contain pesticides or kepone at levels that would warrant further investigation. Therefore, NFA was recommended for these sites. The Final PA/SI was published in January 1992.	199201
FTEUST-20	BUILDING 2005 POL UST	This site is within the area of the Fire Fighting Training Area, which is currently under a RI/FS. Any potential contamination in the area would be identified under the investigation being conducted for the Fire Fighting Training Area. There is NFA planned for this site under the IRP.	198809
FTEUST-21	BUILDING 801 CENTRAL HEAT PLANT	In October 1996, the Fort Eustis UST program removed the four USTs and replaced them with two 25,000 gallon fiberglass tanks. Site closed 24 February 1995 per VDEQ letter.	199502
FTEUST-22	PX WASTE OIL UST	The used oil UST portion of the site is closed. The contamination and any future remedial activities associated with the service station tanks will be conducted under AEDB-R site AAFES Service Station, Bldg. 1380.	198809
FTEUST-28	WASTE OIL STORAGE TANKS	Based on the IRA and 1996 Confirmatory Studies, NFA was requested. All monitoring wells associated with the site have been properly abandoned. The VDEQ issued a NFA letter for this site on 26 March 2003.	199603
FTEUST-31	OLD PESTICIDE STORAGE BLDG	Since the groundwater underlying the site is not used as a potable drinking water source and there is minimal soil contamination, the Confirmation Study (CS) report recommended NFA at the site. There is NFA programmed. USEPA and VDEQ have not formally agreed with Fort Eustis recommendation of NFA. This issue will be raised during the negotiations of Fort Eustis FFA.	199603

IRP Schedule

Initiation of IRP: 1977

Past Phase Completion Milestones

1990
• FS - FTEUST-02, 04 - Jul

1992
• PA/SI - FTEUST-11, 12, 13, 14, 19, 21 - Jan
• RD - FTEUST-02, 04 – Jun

1994
• IRA - FTEUST-28, 32 - Jun
• RA - FTEUST-02, 04 - Aug

1995
• RI/FS - FTEUST-21 - Feb
• RI/FS - FTEUST-26 - Oct

1996
• RA - FTEUST-26 - Jan
• PA/SI - FTEUST-28, 31 - Mar
• RD - FTEUST-35 - Sep
• RA - FTEUST-35 - Oct

1997
• IRA - FTEUST-34 - Jul

1999
• IRA - FTEUST-29 - Oct

2000
• IRA - FTEUST-30 - Apr

2001
• RI/FS - FTEUST-34 - Jul
• ROD - FTEUST-34 - Sep
• RI/FS - FTEUST-19 – Oct

2002
• RD - FTEUST-34 - Jun
• ROD - FTEUST-19 - Oct

2003
• RD - FTEUST-19 - Apr
• RAC - FTEUST-34 - Jul

2004
- RAO - FTEUST-35 - Jan
- RAC - FTEUST-19 - Jul

2005
- RI/FS - FTEUST-27 - Sep
- ROD - FTEUST-27 - Sep
- RI/FS - FTEUST-29 - Aug
- ROD - FTEUST-29 - Aug
- RD - FTEUST-29 - Dec
- RI/FS- FTEUST-30 - Dec
- SI - FTEUST-33 - May

2006
- RI/FS - FTEUST-27 - Aug
- RD - FTEUST-29 - Aug
- SI - FTEUST-33 - May
- RC - FTEUST-33 - May
- RI/FS - FTEUST-36 - Nov

Projected Record of Decision (ROD)/Decision Document (DD) Approval Dates:
- FTEUST-06 - Fire Training Area ROD – 2008
- FTEUST-27 – Milstead Creek ROD – 2006
- FTEUST-29 – Brown's Lake ROD – 2006
- FTEUST-30 – Bailey Creek ROD – 2009
- FTEUST-32 - Felker Airfield ROD – 2008
- FTEUST-36 - Eustis Lake ROD – 2006

Projected Construction Completion Date of IRP and Removal from NPL: 2010 & 2014

Schedule for Next Five Year Review: 2006

Estimated Completion Date of IRP (including LTM phase): 2024

FORT EUSTIS IRP SCHEDULE

(Based on current funding constraints)

AEDB-R #	PHASE	FY07	FY08	FY09	FY10	FY11	FY12	FY13	FY14	FY15+
FTEUST-02	LTM									
FTEUST-04	LTM									*202406*
FTEUST-06	RD									
	RA(C)									
	RA(O)									
	LTM									*202403*
FTEUST-19	LTM									
FTEUST-26	LTM									
FTEUST-29	LTM									*201609*
FTEUST-30	LTM									*201808*
FTEUST-32	LTM									
FTEUST-34	LTM									
FTEUST-35	LTM									
FTEUST-36	LTM									*201510*

Prior Years Funds

Total Funding up to FY04: $48,701K

Year	Site Information	Expenditures	FY Total
FY05	FTEUST-02 - LTM (GW and cap maintenance)	$47.3K	
	FTEUST-04 - LTM	$6.0K	
	FTEUST-06 - RI/FS	$5.0K	
	FTEUST-19 - LTM	$26.0K	
	FTEUST-26 - LTM	$2.0K	
	FTEUST-29 – RI/FS	$97.1K	
	FTEUST-30 – RI/FS	$92.5K	
	FTEUST-33 – SI	$3.1K	
	FTEUST-34 - LTM	$38.4K	
	FTEUST-35 - LTM	$15.0K	
	FTEUST-36 – RI/FS	$88.6K	**$421K**

Total Prior Year Funds: $49,122K

Current Year Requirements

Year	Site Information	Requirements	FY Total
FY06	FTEUST-02 - LTM	$46.3K	
	FTEUST-04 - LTM	$6.0K	
	FTEUST-06 - RD	$92.0K	
	FTEUST-19 - LTM	$27.0K	
	FTEUST-26 - LTM	$2.1K	
	FTEUST-29 - RAC	$470.0K	
	FTEUST-29 - RD	$63.7K	
	FTEUST-30 - RI	$425.0K	
	FTEUST-34 - LTM	$81.0K	
	FTEUST-35 - LTM	$15.0K	
	FTEUST-36 - RI	$150.0K	**$1,378.1K**

Total Requirements FY06: $1,378.1K

Total Future Requirements: **$5,361K**

Total IR Program Cost *(from inception to completion of the IRP):* **$55,861.1K**

FORT EUSTIS

Military Munitions Response Program

MMRP Summary

Total AEDB-R MMRP Sites / AEDB-R Sites with RC: 12/0

AEDB-R Site Types
7 Small Arms Ranges
4 Firing Ranges
1 Pistol Range

Most Widespread Contaminants of Concern: MC

Media of Concern: Soil

Completed REM/IRA/RA: None

Total MMRP Funding

Prior Years (up to FY05):	$	251,345
Current Year (FY06):.....	$	0
Future Requirements (FY07+): ...	$	44,405,000
Total:	$	44,656,345

Duration of MMRP
Year of MMRP Inception: 2001
Year of MMRP RC: 2017
Year of MMRP Completion Including LTM: 2047

MMRP Contamination Assessment

MMRP Contamination Assessment Overview

The Department of Defense (DoD) has established the MMRP under Defense Environmental Restoration Program (DERP) to address DoD sites with munitions and explosives of concern including unexploded ordnance (UXO), discarded military munitions (DMM), and MC.

The United States (US) Army's inventory of Closed, Transferring, and Transferred (CTT) Military ranges and sites, has identified sites eligible for action under MMRP.

The MMRP eligible sites include other than operational ranges where UXO, DMM and MC is known or suspected and the release occurred prior to September 30, 2002. Properties classified as operational ranges are not eligible and, therefore, are excluded from the MMRP program.

The MMRP began in the 1990s as a result of key drivers such as processes outlined in the National Contingency Plan (40 CFR 300) as authorized by the Comprehensive Environmental Response, Liability Act of 1980, 42 US Code (USC.) 9605, as amended by the Superfund Amendments and Reauthorization Act of 1986, Pub. L. 99-499, (hereinafter CERCLA).

The process began with three phases of range inventories. Phase 1 consisted of installations completing an initial data call. USAEC managed the implementation Phases 2 and 3 of the MMRP inventory.

The Phase 2 inventory dealt with active and inactive range considerations. The Phase 3 Army Range Inventory was completed at Fort Eustis in May 2003 and identified twelve sites as eligible for the MMRP. The Phase 3 inventory serves as a PA under CERCLA. A SI began in October 2005 and is currently underway.

MMRP Cleanup Exit Strategy

The installation plans to complete the SI by September 2006 and execute follow-on phases/actions as required in the individual site cleanup strategies.

Previous Studies

2002

• Fort Eustis (Phase 3) CTT Range/Site Inventory Report, Malcolm Pirnie, Oct-02

FORT EUSTIS

Military Munitions Response Program
Site Descriptions

FTEUS-001-R-01
Engineer's Rifle Range

SITE DESCRIPTION

The closed Engineer's Rifle Range occupied approximately 23 acres. It consisted of a Known Distance Range with targets located 100, 200, 300, and 500 feet from the firing points. This range was used for practice firing and sighting of rifles and machine guns. The Engineer's Rifle Range opened in 1936 and remained operational until 1945. Today, the site is partially developed with storage buildings, warehouses, and a parking lot.

STATUS

REGULATORY DRIVER: CERCLA

RAC SCORE: 5 - Negligible Risk

CONTAMINANTS OF CONCERN: Lead

MEDIA OF CONCERN: Soil

Phases	Start	End
PA	200111	200305
SI	200506	200703
RI/FS	201110	201209
RD	201510	201609
RA(C)	201610	201709

RC DATE: 201709

CLEANUP STRATEGY

A Historical Record Review (HRR), SI, RI/FS, RD and RA(C) are expected to be performed at this site. The soil remediation will include excavation, off-site transportation and disposal, and funding estimates are based on the size of this site.

FTEUS-002-R-01
Harrison Road Small Arms Range

SITE DESCRIPTION

The closed Harrison Road Small Arms Range occupied approximately 17 acres. The range was built along the western boundary of Fort Eustis in 1936, and the direction of fire was toward the James River. The primary use of this range was for practice firing and sighting of rifles and pistols. The range was operational from 1936 to 1945. The site was used as a coal yard prior to becoming a storage yard for the DPW.

STATUS

REGULATORY DRIVER: CERCLA

RAC SCORE: 5 - Negligible Risk

CONTAMINANTS OF CONCERN: Lead

MEDIA OF CONCERN: Soil

Phases	Start	End
PA	200111	200305
SI	200506	200703
RI/FS	201110	201209
RD	201510	201609
RA(C)	201610	201709

RC DATE: 201709

CLEANUP STRATEGY

A HRR, SI, RI/FS, RD and RA(C) are expected to be performed at this site. The soil remediation will include excavation, off-site transportation and disposal, and funding estimates are based on the size of this site.

FTEUS-003-R-01
Pistol Range

SITE DESCRIPTION

The closed Pistol Range adjacent to building 2123 opened in 1918 and encompasses 4 acres. The range was used to practice fire and sight small arms weapons to enhance firing proficiency and maintain marksmanship qualifications. A closed landfill is located in this area as well as the Officers Club, swimming pool, tennis courts and the Bachelor Officers' Quarters. The pistol range was closed in 1920.

STATUS

REGULATORY DRIVER: CERCLA

RAC SCORE: 5 - Negligible Risk

CONTAMINANTS OF CONCERN: Lead

MEDIA OF CONCERN: Soil

Phases	Start	End
PA	200111	200305
SI	200506	200703
RI/FS	201110	201209
RD	201510	201609
RA(C)	201610	201709

RC DATE: 201709

CLEANUP STRATEGY

A HRR, SI, RI/FS, RD and RA(C) are expected to be performed at this site. The soil remediation will include excavation, off-site transportation and disposal, and funding estimates are based on the size of this site.

FTEUS-004-R-01
Langley Field Gunnery Range

SITE DESCRIPTION

The closed Langley Field Gunnery Range encompassed 479 acres. It was formerly known as the Pattern Gunnery Range or Moving Target Range. The range opened in 1930 and had an elaborate electrically operated railway system with eight flexible and 12 stationary targets. The gunners would practice firing the .30 and .50 caliber machine guns at moving targets to simulate vehicles and troop movement. Records indicate that the range was still active in 1944, and is believed to have closed in 1945. The northern portion of this range was also used as a skeet range. The area is now part of the golf course.

STATUS

REGULATORY DRIVER: CERCLA

RAC SCORE: 5 - Negligible Risk

CONTAMINANTS OF CONCERN: Lead

MEDIA OF CONCERN: Soil

Phases	Start	End
PA	200111	200305
SI	200506	200703
RI/FS	201110	201209

RC DATE: 201209

CLEANUP STRATEGY

A HRR, SI, and RI/FS are expected to be performed at this site. The soil remediation will include excavation, off-site transportation and disposal, and funding estimates are based on the size of this site.

FTEUS-005-R-01
Lee Hall Observation Balloon School

SITE DESCRIPTION

The Lee Hall Balloon Observation School Range covered 60 acres. It opened in July of 1918 and was used to train observers to observe enemy movements and issue fire. The firing range was part of the 420-acre school facility. The range was used for proficiency training, allowing the balloon observers to fire .30 and .50 caliber machine guns from the balloon platform onto simulated enemy ground targets. However, the firing was short lived because the recoil from the machine guns moved the balloons too much. The school was located in the 800 Block of Lee Boulevard and Cameron Place. The school was officially closed in 1919. The area now consists of housing, barracks, and commercial buildings.

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STATUS

REGULATORY DRIVER: CERCLA

RAC SCORE: 5 - Negligible Risk

CONTAMINANTS OF CONCERN: Lead

MEDIA OF CONCERN: Soil

Phases	Start	End
PA	200111	200305
SI	200506	200703
RI/FS	201110	201209

RC DATE: 201209

CLEANUP STRATEGY

A HRR, SI, and RI/FS are expected to be performed at this site. The soil remediation will include excavation, off-site transportation and disposal, and funding estimates are based on the size of this site.

FTEUS-006-R-01
Murphy Field Artillery Range

SITE DESCRIPTION

The closed Murphy Field Artillery Range was constructed sometime before 1918 and covered approximately 69 acres. The range was used to practice fire 8-inch and 155mm artillery pieces. The impact area was approximately three miles south of the gun emplacements on Mulberry Island. The impact area on Mulberry Island is classified as operational range area. The majority of the area between the firing point and the impact area is in the cantonment area which is highly developed and well traveled. The team did not uncover any UXO incident reports for this area. Only the firing portion of the Murphy Field Artillery Range is included in the CTT inventory. The range was closed in 1926 and is now used for recreation such as football, baseball, and track.

STATUS

REGULATORY DRIVER: CERCLA

RAC SCORE: 2 - Serious Risk

CONTAMINANTS OF CONCERN: UXO, Lead

MEDIA OF CONCERN: Soil

Phases	Start	End
PA	200111	200305
SI	200506	200703
RI/FS	201110	201209
RA(C)	201610	201709
LTM	201710	204709

RC DATE: 201709

CLEANUP STRATEGY

A HRR, SI, RI/FS, RD and RA(C) are expected to be performed at this site. The soil remediation will include excavation, off-site transportation and disposal, and funding estimates are based on the size of this site. UXO and DMM remediation will also be necessary at this site, to include UXO removal, land use controls, and 30 years of monitoring.

FTEUS-007-R-01
Thompson Circle Rifle Range

SITE DESCRIPTION

The closed Thompson Circle Rifle Range covered 15 acres just north of the building 2123 pistol range. The primary use of this range was to practice fire and sight rifles, and to maintain marksmanship qualifications. The range was in an area that is now the Officers' Club, swimming pool, tennis courts and the Bachelor Officers' Quarters. The rifle range was closed in 1920.

STATUS

REGULATORY DRIVER: CERCLA

RAC SCORE: 5 - Negligible Risk

CONTAMINANTS OF CONCERN: Lead

MEDIA OF CONCERN: Soil

Phases	Start	End
PA	200111	200305
SI	200506	200703
RI/FS	201110	201209
RD	201510	201609
RA(C)	201610	201709

RC DATE: 201709

CLEANUP STRATEGY

A HRR, SI, RI/FS, RD and RA(C) are expected to be performed at this site. The soil remediation will include excavation, off-site transportation and disposal, and funding estimates are based on the size of this site.

FTEUS-008-R-01
Towable Target Range-TD

SITE DESCRIPTION

The transferred Towable Target Range-TD occupies 23,559 acres. It was used by artillery units to fire at towed targets that were made to resemble submarines. The impact area was along the entire southwestern shore of Mulberry Island extending out into the James River 10,000 yards. Since the locations of the firing points and angle of fire are unknown, the range was drawn perpendicular to the shore of Mulberry Island. Portions of the Towable Target Range-TD overlap both the on-post and off-post portions of the Camp Wallace Firing Fan.

STATUS

REGULATORY DRIVER: CERCLA

RAC SCORE: 3 - Moderate Risk

CONTAMINANTS OF CONCERN: UXO, Lead

MEDIA OF CONCERN: Soil

Phases	Start	End
PA	200111	200305
SI	200506	200703
RI/FS	201110	201209
RD	201510	201609
RA(C)	201610	201709
LTM	201710	204709

RC DATE: 201709

CLEANUP STRATEGY

A HRR, SI, RI/FS, RD and RA(C) are expected to be performed at this site. The soil remediation will include excavation, off-site transportation and disposal, and funding estimates are based on the size of this site. UXO and DMM remediation will also be necessary at this site, to include UXO removal, land use controls, and 30 years of monitoring.

FTEUS-009-R-01
Mulberry Aerial Gunnery Range

SITE DESCRIPTION

The closed Mulberry Island Aerial Gunnery Range opened in 1930 and occupied 216 acres. It was also known as the Felker Field Quad .50 caliber Anti-Aircraft Field. An operational area divides the range. The range also overlaps portions of the Camp Wallace Firing Fan. The range was used for anti-aircraft firing practice using the quad .50 caliber machine gun. According to a memorandum dated March 4, 1942, anti-aircraft training was held every Thursday and Friday. The range closed in the mid 1950s.

STATUS

REGULATORY DRIVER: CERCLA

RAC SCORE: 2 - Serious Risk

CONTAMINANTS OF CONCERN: UXO, Lead

MEDIA OF CONCERN: Soil

Phases	Start	End
PA	200111	200305
SI	200506	200703
RI/FS	201110	201209
RD	201510	201609
RA(C)	201610	201709
LTM	201710	204709

RC DATE: 201709

CLEANUP STRATEGY

A HRR, SI, RI/FS, RD and RA(C) are expected to be performed at this site. The soil remediation will include excavation, off-site transportation and disposal, and funding estimates are based on the size of this site. UXO and DMM remediation will also be necessary at this site, to include UXO removal, land use controls, and 30 years of monitoring.

FTEUS-010-R-01
Towable Target Range

SITE DESCRIPTION

The closed Towable Target Range occupies approximately 91 acres along the bank of the James River. The range was in use from approximately 1936 to 1944. Artillery units fired over the waters of the James River along the entire southwestern shore of Mulberry Island. Since the firing points for the Towable Target Range have been removed, the entire southwestern shoreline of Mulberry Island (excluding operational area) was included in the CTT inventory. The inland boundary of the Towable Target Range was established 100 yards from the shoreline. Portions of the Towable Target Range are overlapped by the Camp Wallace Firing Fan.

STATUS

REGULATORY DRIVER: CERCLA

RAC SCORE: 3 - Moderate Risk

CONTAMINANTS OF CONCERN: UXO, Lead

MEDIA OF CONCERN: Soil

Phases	Start	End
PA	200111	200305
SI	200506	200703
RI/FS	201110	201209
RD	201510	201609
RA(C)	201610	201709
LTM	201710	204709

RC DATE: 201709

CLEANUP STRATEGY

A HRR, SI, RI/FS, RD and RA(C) are expected to be performed at this site. The soil remediation will include excavation, off-site transportation and disposal, and funding estimates are based on the size of this site. UXO and DMM remediation will also be necessary at this site, to include UXO removal, land use controls, and 30 years of monitoring.

FTEUS-011-R-01
Camp Wallace Firing Fan

SITE DESCRIPTION

Camp Wallace was used as a coast artillery training installation. Railguns were fired from Camp Wallace toward targets on Mulberry Island and into Burwell's Bay (the James River). The impact area consisted of 15,555 acres, the majority of which is in the James River except for Mulberry Island which is part of Fort Eustis. Approximately 205 acres of the Camp Wallace Firing Fan are included in the CTT inventory. The remaining area is either off-post, operational property, or co-located with other CTT ranges (Mulberry Island Aerial Gunnery Range, Towable Target Range, and Towable Target Range-TD). Camp Wallace and the off-post portion of the Camp Wallace Firing Fan are covered under the Formerly Used Defense Sites inventory. Construction on Camp Wallace was completed in June 1919. Potential ordnance present includes 90mm, 155mm, 8 inch, 12 inch, and 14 inch projectiles. The rail lines were abandoned in the 1930s. Camp Wallace continued to be used for training, but no additional reference to artillery firing toward Mulberry Island is available.

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STATUS

REGULATORY DRIVER: CERCLA

RAC SCORE: 2 - Serious Risk

CONTAMINANTS OF CONCERN: UXO, Lead

MEDIA OF CONCERN: Soil

Phases	Start	End
PA	200111	200305
SI	200506	200703
RI/FS	201110	201209
RD	201510	201609
RA(C)	201610	201709
LTM	201710	204709

RC DATE: 201709

CLEANUP STRATEGY

A HRR, SI, RI/FS, RD and RA(C) are expected to be performed at this site. The soil remediation will include excavation, off-site transportation and disposal, and funding estimates are based on the size of this site. UXO and DMM remediation will also be necessary at this site, to include UXO removal, land use controls, and 30 years of monitoring.

FTEUS-012-R-01
1000” Rifle Range

SITE DESCRIPTION

The closed 1000” Rifle Range occupied approximately 7 acres. The 1000” Rifle Range was used for practice firing and sighting of rifles and machine guns. The 1000” Rifle Range opened in 1936 and remained operational until 1945. Today, the site is partially developed with storage buildings, warehouses, and a parking lot. A concrete berm is still present at the site.

STATUS

REGULATORY DRIVER: CERCLA

RAC SCORE: 5 - Negligible Risk

CONTAMINANTS OF CONCERN: Lead

MEDIA OF CONCERN: Soil

Phases	Start	End
PA	200111	200305
SI	200506	200703
RI/FS	201110	201209
RD	201510	201609
RA(C)	201610	201709

RC DATE: 201709

CLEANUP STRATEGY

A HRR, SI, RI/FS, RD and RA(C) are expected to be performed at this site. The soil remediation will include excavation, off-site transportation and disposal, and funding estimates are based on the size of this site.

MMRP Schedule

Initiation of MMRP: 2001

Past Phase Completion Milestones

2003

- PA completion at FTEUS-001-R-01, FTEUS-002-R-01, FTEUS-003-R-01, FTEUS-004-R-01, FTEUS-005-R-01, FTEUS-006-R-01, FTEUS-007-R-01, FTEUS-008-R-01, FTEUS-009-R-01, FTEUS-010-R-01, FTEUS-011-R-01, FTEUS-012-R-01.

Projected ROD/DD Approval Dates: N/A

Projected Construction Completion: 2017

Schedule for Five Year Reviews: TBD

Estimated Completion Date of MMRP including LTM: 2047

FORT EUSTIS MMRP SCHEDULE

(Based on current funding constraints)

AEDB-R #	PHASE	FY07	FY08	FY09	FY10	FY11	FY12	FY13	FY14	FY15+
FTEUS-001-R-01	RI/FS									
	RD									*201609*
	RA(C)									*201709*
FTEUS-002-R-01	RI/FS									
	RD									*201609*
	RA(C)									*201709*
FTEUS-003-R-01	RI/FS									
	RD									*201609*
	RA(C)									*201709*
FTEUS-004-R-01	RI/FS									
FTEUS-005-R-01	RI/FS									
FTEUS-006-R-01	RI/FS									
	RA(C)									*201709*
	LTM									*204709*
FTEUS-007-R-01	RI/FS									
	RD									*201609*
	RA(C)									*201709*
FTEUS-008-R-01	RI/FS									
	RD									*201609*
	RA(C)									*201709*
	LTM									*204709*
FTEUS-009-R-01	RI/FS									
	RD									*201609*
	RA(C)									*201709*
	LTM									*204709*
FTEUS-010-R-01	RI/FS									
	RD									*201609*
	RA(C)									*201709*
	LTM									*204709*
FTEUS-011-R-01	RI/FS									
	RD									*201609*
	RA(C)									*201709*
	LTM									*204709*
FTEUS-012-R-01	RI/FS									
	RD									*201609*
	RA(C)									*201709*

MMRP Costs

Prior Years Funds

Total Funding up to FY04: $0

Year	Site Information	Expenditures	FY Total
FY05	PA	$25,000	
	SI (12 Sites)	$226,345	**$251,345**

Total Funding up to FY05: $251,345

Current Year Requirements

Year	Site Information	Requirements	FY Total
FY06		$0	**$0**

Total Requirements FY06: $0

Total Future Requirements: **$44,405,000**

Total MMR Program Cost *(from inception to completion of the IRP):* **$44,656,345**

Community Involvement

A TRC was established in April 1995. In February 1997 (FY97), Fort Eustis canvassed its surrounding communities for potential interest in establishing a RAB. There was not enough interest to form a RAB. Due to the lack of community interest, qualified applicants from the February 1997 canvassing were asked to participate in the TRC. In early March 1999, Fort Eustis once again solicited public interest and it was determined a RAB was not necessary.

In December 1999, community interviews were conducted as part of a project to update Fort Eustis' Community Relations Plan. An USEPA representative participated in the interview process and noted from the responses during the interviews that sufficient community interest to form a RAB does not exist. The updated CRP will make recommendations and outline how Fort Eustis will inform the community of the cleanup process being conducted on post.

Based on the updated CRP and the USEPA recommendations, Fort Eustis conducted its October 2000 TRC meeting in the evening and open to the public. The meeting was conducted at Grissom Library on 26 October. Fort Eustis advertised the open meeting in three local newspapers and the on-post newspaper to get community interest. Only two local individuals attended.

Fort Eustis is located adjacent to the city of Newport News, Virginia, which has a 2002 estimated population of approximately 182,000.

Efforts Taken to Determine Interest

Fort Eustis conducted the following to determine potential interest in establishing a RAB:

(1) Asked the TRC members at the October 1996 meeting what their thoughts were in converting the TRC to a RAB.
(2) In February 1997, placed advertisements in the Daily Press, Yorktown Crier and the Denbigh Gazette explaining what a RAB is and asking that all interested parties call the Fort Eustis Public Affairs Office (PAO) for a Community Interest Form and Fact Sheet.
(3) Sent Community Interest Forms and Fact Sheets to six individuals who responded the February 1997 newspaper advertisement.
(4) In Mach 1999, placed advertisements in the Daily Press and Virginia Gazette explaining what a RAB is and asking that all interested parties call the Fort Eustis PAO. The Yorktown Crier and Denbigh Gazette went out of business.
(5) In December 1999, conducted community interviews for Fort Eustis' Community Relations Plan. Interviewed 18 individuals including Newport News city officials, post residents, off-post residents and community organizations/environmental groups.
(6) Since the October 2002 TRC, meetings have been held off-post and are open to the public. Public notices were placed in several newspapers for each meeting. Notices were also mailed to all individuals on Fort Eustis' mailing list.
(7) Asked the TRC members at the April 2004 meeting what their thoughts were in converting the TRC to a RAB. Community Interest Forms were available at the meeting for those interested in establishing a RAB.

(8) In May 2004, placed advertisements in the Daily Press, Yorktown Crier and the Fort Eustis newspaper, The Wheel, explaining what a RAB is and asking that all interested parties call the Fort Eustis PAO for a Community Interest Form.

Results

(1) At the October 1996 TRC, members, including a community member, did not support converting the TRC to a RAB. All members felt that there would be little or no interest from the community.

(2) Received six responses to the February 1997 paid advertisements in the three community newspapers. The Fort Eustis PAO sent each respondent a Community Interest Form and Fact Sheet. Only four individuals responded. Results indicated there was not enough interest to form a RAB. However, these four individuals were asked to participate in the TRC meetings. All four are currently involved in the TRC meetings.

(3) Received six responses to the March 1999 paid advertisements in two local community newspapers. The Fort Eustis Public Affairs Office sent each respondent a Community Interest Fort and Fact Sheet. Only three individuals responded. Results indicated there was not enough interest to form a RAB. Fort Eustis sent these individuals a letter thanking them for their interest and willingness to assist in Fort Eustis' environmental cleanup program. If circumstances change, these individuals will be contacted to see if they are still interested and available.

(4) Only one or two community individuals attended each of the TRC meetings since October 2000.

(5) Received two responses to the May 2004 paid advertisements in three local community newspapers. Both individuals completed a Community Interest Form. Results indicated there was not enough interest to form a RAB. One of the individuals currently participates in the TRC meetings and the other will be added to the TRC mailing list and asked to participate in the meetings.

Conclusions

Based on the small number of community members expressing interest during the February 1997, March 1999, and May 2004 newspaper advertisements, the December 2000 community interviews, and the open TRC meetings, it has been determined that a RAB is not necessary at this time. The TRC will continue to monitor all remediation efforts at Fort Eustis as it has done in the past.

Follow-up Procedures

Fort Eustis is committed to involving the public in its restoration program and recognizes that interest in restoration activities can change. Fort Eustis will continue to monitor community interest. Community interest activities will again include distribution of interest surveys via newspaper advertisements every two years and annually at TRC meetings.

Interest in the TAPP Program

At the 23 April 1998 TRC meeting, the TAPP Program was presented. The following topics were discussed: the goals of the TAPP Program, eligible projects, the requesting funds, and the application process and contracting processes. A brochure published by the Assistant Deputy Under Secretary of Defense (Environmental Cleanup) was given to all members. At this time, no community members have expressed interest in participating in the TAPP Program.